American Journal of Public Health
and THE NATION'S HEALTH

Volume 37 September, 1947 Number 9

An Evaluation of the Use of BCG in the Prevention of Tuberculosis in Infants and Children*

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OF the many attempts at vaccination or inoculation against tuberculosis, none has been more widely used or more publicized than the use of BCG vaccine.

This vaccine is a living attenuated strain of an originally virulent bovine tubercle bacillus. So marked was its attenuation after a series of cultivations on a glycerol potato bile medium, that it no longer was capable of producing progressive tuberculosis in guinea pigs, rabbits, or calves, and, although over 5,000,000 children have been inoculated with it since 1922, there is no authentic case on record of the organism having returned to its former virulence.

There is also undeniable proof that BCG vaccine as well as heat killed tubercle bacilli produce definite protection against tuberculosis in experimental animals.

However, it has been demonstrated on numerous occasions that the fact that experimental animals receive protection from vaccines, inoculations, or drugs, does not necessarily signify that human beings will receive the same protection.

It is therefore of the greatest importance that carefully controlled studies on human beings be reported before the use of BCG vaccine is accepted as of proven value as a public health measure in the prevention of tuberculosis.

In 1926 a culture of BCG was brought to the United States by the late Dr. William H. Park of the New York City Department of Health, and in the same year the studies on immunization of children were initiated in New York City.

On the basis of this study a great deal was learned and as a result of this the following standards were set down as

* Presented before the Maternal and Child Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

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necessary for a scientific conclusion:

Essential Factors in Study of BCG Immunization

1. Vaccine must be of standard strength.
2. There must be controls.
3. Controls and vaccinated cases should:
   a. Be selected by alternation to eliminate possibility of bias.
   b. Have identical follow-up.
   c. Come from same locality.
   d. Come from similar age group.
   e. Come from similar racial group.
4. Contact with cases must be maintained.
5. Exposure conditions of cases must be known throughout study period.
6. A reliable diagnosis at death.

Throughout the years, numerous studies have been reported on the value of BCG inoculation, and the great majority of these reports have been favorable. However, with few exceptions all of these studies were inadequately controlled and very few of the factors mentioned above were considered.

In some studies the mortality rate from tuberculosis of the general population was compared with that of the vaccinated group; in others a different age group served as a control; in some the tuberculosis mortality of vaccinated children was compared with the tuberculosis mortality of previous years; in other studies the controls comprised cases where vaccination was refused; in still others the control group was less carefully followed than the vaccinated cases; in one study, only the vaccinated cases were temporarily separated from the tuberculous source.

Recently a paper has been published concerning the results of BCG vaccination in Scandinavia.[8] In all of the countries reported the results have been favorable, but again the method of control selection is open to criticism. In Oslo and in Bergen, Norway, the tuberculosis mortality of the vaccinated group was compared with that of the general population. In Stockholm, Sweden, where excellent results were reported by Wallgren no controls were used. In answer to objections that no adequate controls were used, Wallgren stated that parents very seldom refuse to consent to BCG vaccination. The studies in Norrbotten, Orebro, and Boraas, all in Sweden, were also controlled by the general population. The vaccination has also been used extensively in Denmark, but controls are almost entirely lacking.

However, in spite of inadequate controls, and the knowledge that results at the present time cannot be considered as conclusive, one cannot overlook the fact that practically all of these reports have been uniformly favorable. Notable exceptions are the studies from New York City[1] and those of Blanch, Blanch, and Liertier of Uruguay.[2]

The latter authors have vaccinated over 103,000 infants in Uruguay since 1930 by oral, subcutaneous, intracutaneous, and multiple puncture methods. The tuberculosis mortality among the vaccinated infants was 7 per cent as against a tuberculosis mortality of 5.2 per cent of the controls.

At the start of the work in New York City, an attempt was made to control the study by dividing the accepted children into two equal groups: those for vaccination and those to serve as controls. Under this system a physician was assigned a number of cases and told to vaccinate one-half of the group. Subsequent experience has proved that by this method of selection the general tendency was to inoculate the children of the more coöperative parents and keep the children of non-coöperative parents as controls. The effect of this error will be readily realized with the knowledge that the more coöperative parent usually brings the child to the clinic more often and follows the physician's instructions more carefully.

The arbitrary division of cases was followed from 1927 until January 1, 1933, during which time 990 children

were studied, of which 445 were vaccinated.

The results at the end of this period are shown in Table 1.

TABLE 1

Results January 1, 1933—Prior to Institution of Alternate Selection

	Cases	Tuberculosis Deaths	
		Number	Per cent
Vaccinated	445	3	0.68
Controls	545	18	3.38

The figures as of that date showed the tuberculosis mortality of the controls to be almost five times that of the vaccinated cases.

The method of selection was changed on January 1, 1933, so that alternate children were routinely vaccinated. The selection was made at headquarters as soon as the names were received and before they were assigned to staff pediatricians.

It is interesting to note the tuberculosis mortality in the two groups before and after this alternation was instituted (Table 2).

TABLE 2

Comparative Results Before and After Alternate Selection

	Cases	Tuberculosis Deaths	
		Number	Per cent
Total Cases			
BCG vaccinated	1,011	11	1.08
Controls	1,073	26	2.42
Cases 12/15/26–1/1/33 (before alternate selection)			
BCG vaccinated	445	3	0.68
Controls	545	18	3.38
Cases 1/1/33–1/1/44 (after alternate selection)			
BCG vaccinated	566	8	1.41
Controls	528	8	1.51

In the second period (January 1, 1933, to January 1, 1944) after the institution of alternate selection, the tuberculosis mortality figures were essentially the same for both the vaccinated cases and the controls.

Studies on the variables which might have been responsible for the change in comparative tuberculosis mortality brought out that the coöperation of the vaccinated group was appreciably greater than that of the control group prior to the period of alternation, with considerably closer approximation in the latter period.[1]

Other variables such as exposure, racial distribution, and economic conditions appeared to have no influence on the change. However, since the tuberculosis mortality of the vaccinated cases increased after January 1, 1933, the question arose as to whether there was any loss in activity of the BCG vaccine. A history of the BCG vaccine used in the New York study revealed the following:

The original BCG culture was obtained by Dr. William H. Park from Calmette in 1926. Strains of this culture were sent to the Mt. McGregor Sanatorium and to the Phipps Institute. This culture was used in the preparation of the vaccine until late in 1932 when it became contaminated by molds. Pure cultures were at last obtained by the antiformin method and plated on media containing aniline dyes (Loewenstein's and modified Petroff medium). Meanwhile, subcultures were obtained from the Phipps Institute. The cultures were used alternately for vaccine for a period of one year. After this time both cultures were used without selection. Virulence tests were made at 3 month intervals but no tests were made for potency. However, it is to be noted that the percentage of positive tubercu-

lin reactions resulting from BCG inoculations did not decrease after January 1, 1933, there being 87.1 per cent before as against 87.6 per cent after that date, but this does not rule out the possibility of a loss in potency of the cultures after the contamination.

However, it was found that in a limited number of cases where separation for 3 months before and 3 months after vaccination was possible, there was some indication that BCG inoculation might have protective value were such separation practical (Table 3).

TABLE 3

Exposed Cases Separated 3 Months before and 3 Months after Being Vaccinated or Taken Up

		Tuberculosis Deaths	
	Cases	*Number*	*Per cent*
Vaccinated	91	1 *	1.1
Controls	96	3 †	3.1

* This child was born of a mother dying of tuberculosis; was never exposed; died at 3 months of age.
† One case with no known exposure died of tuberculosis at 15 months of age.

In New York City the routine separation of children for 3 months before and 3 months after BCG vaccination to eliminate the hazards of contiguous contamination with human tubercle bacilli was not found to be a feasible or safe procedure.[1]

It was therefore concluded that, as a public health measure in New York City the routine vaccination with BCG of children from tuberculous homes was less advantageous than removal of the tuberculous subjects from the home. It is realized, of course, that a city such as New York with adequate beds for the hospitalization of tuberculous patients presents a situation entirely dissimilar from localities with lack of necessary diagnostic and hospital facilities.

Within recent months the greatest amount of attention in this country has been focused on two particular reports on the efficacy of BCG: The report on Experience with BCG Vaccine in the Control of Tuberculosis Among North American Indians, by Aronson and Palmer,[2] and the study on BCG of the Tice Institute in Chicago by Rosenthal.[3]

It is of interest to appraise these studies in the light of the standards developed as a result of the investigation in New York City.

The studies on Indians were undertaken at eight different reservations in western United States and in Alaska. Approximately equal numbers of Indians were selected for vaccination and controls (Table 4).

It is stated that "a random portion of the tuberculin-negative reactors was vaccinated . . . while the remainder served as controls." Apparently the cases were not alternated and in writing of the method of selection the authors

TABLE 4

Results of BCG Studies on Indian Reservations

	Vaccinated Cases	*Tuberculosis Deaths*	*Controls*	*Tuberculosis Deaths*
Arizona				
Pima A	259	1	263	2
Pima B	95	0	86	2
Wyoming				
Shoshone	110	0	85	1
Arapaho	118	1	106	4
North Dakota				
Chippewa	170	0	162	0
Marty Mission	41	0	25	1
South Dakota				
Rosebud	260	2	266	6
Alaska	497	0	464	12

state, "it is, of course, not possible to be certain that no bias was unintentionally introduced." The vaccinated and control cases balance only fairly well as to age, per cent examined annually, and degree of exposure to tuberculosis. But the studies in New York would seem to indicate that this alone is insufficient and that the impartial selection of cases by alternation is an essential factor in adequate experimentation. It is also necessary to point out the arbitrary ratings of exposure given contact cases in the paper of Aronson and Palmer. For instance, to quote: "The highest rating 3 was limited 'to very intimate contact with a sputum-positive case.'" There is no consideration given, apparently, to whether the case was Gafky I or Gafky X as long as organisms were found in the sputum.

The question of accurate diagnosis at death also must be considered in the review of the study on American Indians. The basis for the diagnosis of the tuberculosis deaths is inadequate when it is reported that "in the control group some of the deaths which were assigned to non-tuberculous causes may actually have been a consequence of tuberculosis." The New York study shows clearly the necessity of an autopsy before a diagnosis of a tuberculous death can be considered entirely accurate.[4]

However, the results of BCG vaccination on the American Indian are reported as favorable and must at least be considered as additional evidence that BCG vaccine has a degree of effectiveness in the prevention of tuberculosis.

The report of ten years' experience with BCG in the City of Chicago also presents favorable results. In this study the cases were alternated without selection, the children were grouped into two general categories; those with no known exposures to tuberculosis (non-contact cases), and those from tuberculous households (contact cases).

The results of the non-contact cases are reported in Table 5.

TABLE 5

Tuberculosis Mortality of Non-Contact Cases (Chicago Study)

	Number of Cases	*Tuberculosis Deaths*	*Tuberculosis Mortality*
Vaccinated	1,204	1	0.08%
Controls	1,213	4	0.33%

It is interesting to note that among these "non-contact" controls the tuberculin tests were positive in 9 per cent at the age of 2 years; 15 per cent at the age of 3 years, and 35 per cent at the age of 5 years. This high morbidity is explained by the fact that the children came largely from a district in Chicago where the tuberculosis mortality ranged as high as 330 per 100,000.

The children who came from tuberculous homes were separated for varying periods of time in foster homes before and after vaccination or for a similar time in the case of controls. Rosenthal states that "BCG should not be expected to accomplish more than other forms of vaccination where protection is afforded against a casual contact with the respective disease, and where isolation is strictly enforced."

The results of contact cases in the Chicago study are shown in Table 6.

TABLE 6

Tuberculosis Mortality of Contact Cases (Chicago Study)

	Number of Cases	*Tuberculosis Deaths*	*Tuberculosis Mortality*
Vaccinated	98	0	0%
Controls	63	3	4.53%

In April, 1946, it was my privilege to visit the Tice Institute in Chicago to become more fully acquainted with the methods used and the results obtained. In this study the method of alternate selection was used, vaccinated cases were separated from contacts before and after inoculation, and controls separated for a similar period of time.

However, several serious factors deserve consideration. Over 300 children

have been lost in the course of the study, and in view of the low tuberculosis mortality rate such a loss cannot be ignored. A more extensive follow-up of exposure to tuberculosis after the children return from the foster homes would also be advisable.

Rosenthal[3] states: "These infants were not returned to the source case, but were kept in a permanent foster home. Fortunately, the State of Illinois forbids a child under 16 years of age to live with a tuberculous member who has a positive sputum." However, inquiries reveal that separation is not strictly enforced and that the tuberculous member of the family may legally sleep in an apartment next door or around the corner but return to his own home during the day.

In the Chicago study, therefore, the exposure to tuberculosis is frequently unknown once the children return from the foster homes.

No information is given in the Chicago study as to the racial percentages in each group, although of the 10 tuberculosis deaths as of April, 1946, 7 were of Negro children. But here again the results are definitely favorable and contribute added evidence as to the probable efficacy of the vaccine.

In the final analysis, the efficacy of BCG vaccine must be determined on the basis of tuberculosis mortality or at least on its ability to prevent the caseous-pneumonic type of pulmonary lesion. The fact that children or nurses vaccinated with BCG show less frequently evidence of pulmonary tuberculous lesions on roentgenographic examination is in itself inadequate and almost valueless evidence.

The first tubercle bacilli inhaled into the lungs produce an area of inflammation about the focal site. This appears as a shadow on chest roentgenograms and is part of the primary complex of tuberculosis, the reaction to the first infection with the tubercle bacillus. Coincident with this the tissues become allergic, and when this area of inflammation subsides, no other inhaled tubercle bacilli are capable of producing again such an area of inflammation. The tissue reaction has been changed by the development of allergy.

When one inoculates the arm or the leg with BCG vaccine a focal reaction occurs, the lymph nodes draining the area enlarge and the tissues become allergic to tuberculin. In other words, the vaccination produces a primary complex in the arm or leg, and one would not expect the typical primary pulmonary infiltration on later exposure to tubercle bacilli. Yet this fact is overlooked completely in many reports which stress the lack of x-ray evidence of pulmonary inflammation after inoculation with BCG. A number of these reports are based on studies of persons entering nursing training schools where certain of the negative reactors to tuberculin testing were vaccinated with BCG. The reports on the American Indians as well as the Chicago study claim effectiveness for the vaccine in the lessened morbidity of the vaccinated cases as evidenced by pulmonary roentenographic findings.

Despite the fact that up to the present time no study on the effectiveness of BCG fulfils all the essential research qualifications, there appears to be considerable circumstantial evidence in its favor. This makes the continuance of BCG research essential. New studies should be undertaken in districts where tuberculosis mortality is high. These new studies and those already in progress should be checked by some central regulating organization which should be responsible for standardizing the vaccine, correlating methods of investigation, and checking the results statistically. Cases should be alternated. Certain controlled studies which were undertaken and discontinued should be taken up again and as many cases con-

tacted as possible in order to follow the children through adolescence. Such studies would include the New York investigation where most of the children are already entering or are in adolescence.

There is still a great deal to be learned about the BCG vaccine.

If the BCG vaccine is effective, what degree of immunity does it confer? Judging from the results of favorable reports one would conclude that the immunity is not complete as with smallpox, diphtheria, or typhoid inoculations. Although a degree of immunity is indicated, a certain number of tuberculosis deaths may still be expected among vaccinated individuals.

Does the effectiveness last only during the period of tuberculin allergy following inoculation (1½ to 2 years on the average) as suggested by some authors, or does immunity remain after the loss of tuberculin allergy, an opinion held by others?

Is separation from a tuberculous source necessary before and after vaccination as claimed by Rosenthal and suggested by the results of the New York study, and if so, can adequate, well controlled foster homes be found?

Why is it that various workers report marked differences in the development of positive tuberculin reactions after vaccination with BCG?

Table 7 summarizes the degree of tuberculin reactivity found in certain studies.

From a public health point of view which would be more efficacious in the eradication of tuberculosis—vaccination with BCG or the separation and hospitalization of all positive sputum cases?

There are so many variables which influence the course of tuberculosis and cause a shift in statistical reports, that

TABLE 7

Author	*Type of Vaccination Used*	*Tuberculin Test Used*	*Per cent Positive Tuberculin Reactors*	*Group Vaccinated*
Aronson [2]	Intradermal 0.1 mg.	PPD	56 1 yr. after vac.	American Indians
Overton [6]	" 0.15 mg.	Dilute tuberculin	100	School children, Nashville, Tenn.
Levine [5]	" 0.15 mg.	"	87.6	Infants under 1 yr. of age, New York City
Rosenthal [4]	Multiple puncture	Tuberculin patch test	99.57	Infants and children, Chicago
Assis [7]	Intradermal 0.1 mg.	Dilute tuberculin	77.78	People of all ages, Brazil
"	Oral 3 doses BCG of 20 to 30 mg. each	"	87.72	New-born infants, Brazil
Heimbeck [8]	Intradermal	Dilute tuberculin	73	394 nurses, Norway
Wallgren [8]	"	"	97.1	Infants and children, Sweden
Gines and Richieri [10]	Multiple puncture	"	97 1 month after vac. 70 1 yr. after vac.	Children and adolescents, Uruguay

renewed and additional research is still necessary before the vaccine can be considered completely efficacious, and be fully accepted as a public health measure.

Is this discrepancy in findings due to the amount and potency of the vaccine used, the method of vaccination, the manner of tuberculin testing, differences in racial groups tested, or the opportunities for contact with human tubercle bacilli?

Further knowledge is also needed concerning the effectiveness of the vaccine in different racial groups, with different degrees of resistance.

Further knowledge is also necessary concerning the stability of potency of the vaccine, and the effectiveness of the vaccine when prepared with different culture media.

It is an accepted fact that although the vaccine has never been known to return to virulence, it does vary in potency, a fact emphasized by Holm.[9] Means for establishing and fixing the potency should be undertaken.

SUMMARY

1. On the basis of over 5 000 000 inoculations of human beings with BCG vaccine, it can be definitely stated that the vaccine is entirely safe.

2. Numerous favorable reports on the efficacy of BCG vaccine in the prevention of tuberculosis have been published. With very few exceptions these studies have been inadequately controlled.

3. In spite of the fact that results to date are scientifically inconclusive, the consistency of favorable reports would seem to indicate that the vaccine has a certain degree of efficacy.

4. The continuance of BCG research is most essential to determine the degree of its effectiveness.

5. Further knowledge is also needed concerning the duration of immunity; the necessity for re-inoculations; the significance of the tuberculin reaction following BCG vaccination; the efficacy of the vaccine in different racial groups; and the potency and efficacy of the vaccine when prepared with different culture media.

6. Renewed and additional research is still necessary before the vaccine can be considered completely efficacious, and be fully accepted as a general public health measure.

REFERENCES

1. Levine, M. I., and Sackett, M. Results of BCG Immunization in New York City. *Am. Rev. Tuberc.*, 53:517, 1946.

2. Blanch, P., Blanch, H., and Lieutier, H. Posicion de la vacuna BCG en la profilaxis de la tuberculosis. *Rev. de tuberc. d. Uruguay*, 13:1, 1945.

3. Aronson, J. D., and Palmer, C. E.: Experience with BCG Vaccine in the Control of Tuberculosis Among North American Indians, Extr. *Pub. Health Rep.*, 61:802, 1946.

4. Rosenthal, S. R., Blahd, and Leslie. Ten Years' Experience with BCG. *J. Pediat.*, 26:470, 1945.

5. Levine, M. I., Vogel, P., and Rosenberg, H. A. Immunization Against Tuberculosis. *Am. Rev. Tuberc.*, 38:632, 1938.

6. Overton, H. Report on BCG Vaccination in Nashville, Tenn. Vaccination Préventative de la Tuberculose. *Rap. et Documents Institut Pasteur, Paris*, 1932.

7. Bueno, M. M. The Control of Tuberculosis in Brazil. *Am. Rev. Tuberc.*, 55:250, 1947.

8. Birkhang, K. BCG Vaccination in Scandinavia. *Am. Rev. Tuberc.*, 55:244, 1947.

9. Holm, J. BCG Vaccination in Denmark. *Pub. Health Rep.*, 61:1298, 1946.

10. Gines, A. R., and Richieri, V. R. Posicion de la vacuna BCG en la profilaxis de la tuberculosis. *Rev. de tuberc. d. Uruguay*, 13:255, 1945.

Experience and Lessons from Emergency Maternity and Infant Care*

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RARELY is it possible to point to any single impulse that motivated a broad public health movement. But in 1942 there came out of Fort Lewis, Washington, a plea for help. Peacetime facilities for maternity care were strained beyond their capacity to serve the needs and demands of the wives of members of the armed forces. Logically, the plea was transmitted to the national agency most directly concerned with maternity health, the Children's Bureau. Thus began the movement that resulted in EMIC—Emergency Maternity and Infant Care.

Looking backward from the vantage point of 1946, the evidence is clear that for this problem of the war there was as little preparation as for the many others. Yet, without the drama that attended the solutions of many other problems, the accomplishments in meeting this one stand as a permanent monument to the combined efforts of medicine and public health. Maternity and infant care were the objectives, and maternity and infant care are the accomplishments. The record of almost a million † completed maternity cases and over one hundred thousand ‡ completed infant cases portrays in cold statistics the enormous activity of EMIC. EMIC began as a minor effort; it grew to such proportions that it became the chief preoccupation of the Children's Bureau and the maternal and child health divisions in the states and territories. And all this was compressed within the limits of about three years. "Emergency" is a mild word to describe the atmosphere and the driving pressure that attended the expansion of maternity and infant care.

When the movement that later became EMIC started in 1942, certain funds already appropriated under Title V of the Social Security Act were used. These were the maternal and child health funds that could be granted to the states on a basis of need, and without matching the so-called "B" funds. Subsequent developments showed the hopelessness of any assumption that the expenditure in this manner of the total "B" funds, amounting to less than two million dollars, would make even an impression on the problem. As the armed forces increased in numbers, so did this problem assume increasing proportions.

Not until March 18, 1943, did Congress approve the first appropriation for EMIC. It amounted to $1,200,000. In July an additional $4,400,000 was approved, and in October the sum granted was $18,600,000. Thus in the first year of its existence EMIC faced the huge task of expending appropriations involving more than 25 million dollars. On June 28, 1944, Congress approved

* Presented at a Joint Session of the Maternal and Child Health, and the School Health Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

† On September 1, 1946, authorized cases totalled 1,133,920.

‡ On September 1, 1946, authorized cases totalled 175,119.

an appropriation of $42,800,000 and for the succeeding fiscal year 45 millions. All told, the plea from Fort Lewis gave direction and momentum to an activity that involved the national government, all of the states, all state and many local health departments, a large part of the medical profession and the general hospitals, over one million families, and over 117 million dollars.

All this might imply that EMIC was born and grew to immense stature without friction, criticism, or acute issues. But to many public health administrators who were closely associated with the program during its most intensive period, EMIC was a source of irritation. It is not an unusual state of affairs for public health workers to be dissatisfied with their own work. In this case, however, the dissatisfaction cannot be explained by the healthy urge to attain perfection.

Few will question the background of accomplishment to which the Children's Bureau can point. But despite strong support, in no period of its history, with the exception of those first years when its activities were limited to research, has there been an unqualified professional acceptance of its existence. For the purpose of this discussion the many particular issues of the past are secondary, but the fact that there were conflicts that resulted in submerged and smoldering antagonisms is important.

In much of the war effort that attended the production of ships, shells, planes, tanks, and bombs, the undertakings were without precedent. The lack of preparation and precedent contributed to many mistakes, but these were condoned because it was recognized that, lacking guiding experience, the process of trial and error is the alternative. The only assurance demanded by the American public was that there be no evidence of venality in any action or failure to act.

In contrast to the usual war emergency agencies, EMIC was placed in an entirely different position. The first appropriation by Congress was made upon the assumption, supported by the testimony, that EMIC was not a new program but the expansion of an existing one. Thus, its organization and administration were assigned to an old agency rather than a new one created by the war and, automatically, EMIC became attached to a long series of precedents. With such an urgent need for an accelerated administrative tempo, and without guiding experience, it was certain that mistakes would be made and precedents would be violated.

One of the first casualties among precedents was the established formula of federal-states relations. This is a formula where the diplomatic amenities are of crucial importance. Time must be expended lavishly—time for conferences, time for education, time for extended negotiations and compromises leading to agreement. And one of the most rigid rules of federal-state etiquette is that neither by act nor expression should the representative of a federal agency dominate or attempt to dominate a state agency. Whatever may be the substance of a program, this form must be maintained.

In the atmosphere of war the concept of getting the job done regardless of costs and feelings usually prevails. Getting the job done in EMIC was the primary concern and, no matter how great might be the verbal emphasis upon states' rights, the need for speed and the movement of patients across state lines forced the central administrative agency into a position where the program became federal rather than federal-state, in the usual sense. Ordinarily three months would be required to complete arrangements for preliminary discussions; in this instance and within the same period the plans of thirty-eight states had been approved by the Children's Bureau. Without a detailed

master plan that served as a blueprint for the state plans there would have been months of delaying negotiations.

The need for speed brought its predictable responses. Regulations were adopted covering the details of administration, and new experiences resulted in changes in regulations. Those affected by the changes felt harassed but this, in itself, did not differ greatly from other war efforts. Where EMIC differed was in the tendency of those concerned with administration to view the program with one eye on the immediate task and one eye on future policy. The interesting feature of the phenomenon is that both the Children's Bureau and the state health departments were concerned over the possible effects of EMIC on future programs. With an eye to the future, what state health departments saw and interpreted as federal domination was disturbing to them.

The Children's Bureau also observed in EMIC some possible post-war difficulties. Getting the job done was the primary ask, but getting it done regardless of costs was another matter. As a cost of war, a fee of $50 or $150 for maternity care is relatively unimportant. But if the fee is regarded as a possible pattern of post-war costs of maternity care it becomes extremely important. Hence, in this aspect and many others the actions of the Bureau were more in accord with a peacetime outlook than a wartime psychology.

These are some of the causes that are discernible in criticisms of EMIC. There is one, however, that perhaps outweighs all of those mentioned. EMIC was launched in a period when there was great debate on the subject of a national health plan. In a short time it became apparent that EMIC *was* a national health plan. Those who regard EMIC as a complete preview give too little attention to its emergency characteristic—the need for speed. They say, "This is it" and assume that what happened in EMIC, be it good or bad, will happen in any national health plan. The assumption gives little credit to the process of learning by trial, error, and experience. If EMIC is regarded as an administrative laboratory, the lessons in it are of incalculable value. They may be applied to a wide variety of situations—national health plans, state health plans, and others. Whether they are applied by national or, particularly, by state and local health departments is a question that cannot be answered now because the future administrative rôle of these departments remains in doubt. But, whatever the agency, the lessons are pertinent.

EMIC demonstrated that the most crucial period in the existence of any large scale plan is that period *before* the distribution of any service begins. While this is no new principle of administration, what EMIC contributed is a much more tangible concept of how much time is needed and how the time must be used. Between the decision to adopt a plan and the delivery of services, a period of at least a year should elapse. Without such a "get-ready" period the plan will duplicate much of the adverse experience of EMIC.

EMIC began without sufficient trained personnel in the Children's Bureau and without sufficient trained personnel in the states. It is in this light that the amazing accomplishments throughout the country must be viewed. But one such demonstration is more than enough to show the pressing need for administrative personnel and to indicate how intensively a training period of a year must be used. Intensive training introduces another responsibility, the development of training facilities and teaching personnel. If this responsibility is not met by schools of public health, as a part of their own "get-ready" period, a chaotic educational effort will result.

The training of personnel and the

testing and perfection of administrative mechanisms are only parts of the work during the preparatory year. A far-reaching program of education is vital to the future success of the health plan. If the Children's Bureau and the state health departments had had a year to confer with and acquaint the medical profession, hospitals, and potential recipients of service with the details of EMIC, how much misunderstanding would have been prevented! And how much would have been learned about the applicability of proposed rules and regulations!

Probably the most outstanding contribution of EMIC to the field of health administration is related to hospitals and hospitalization. The contribution, based upon previous experience with the services for crippled children, involves hospital standards as well as hospital costs. There is a striking agreement among hospital administrators that the EMIC formula for hospital payment, which is based upon the costs of hospital care, focused attention upon a subject that should have been considered long ago. And the EMIC standards for hospital facilities threw new light on the hospital needs of the nation.

It was by one of those significant circumstances that, through EMIC, state departments of health became associated with problems of general hospital administration at a fortunate time.

It was after the EMIC program started that there appeared on the agenda of Congress the Hill-Burton proposal to grant federal funds for hospital construction. In August, 1946, Senate Bill 191 became Public Law 725. Under this law the combined federal and state expenditures for hospital and health center construction may approximate one billion dollars in five years. The federal administrative agency is the U. S. Public Health Service, and any state wishing to avail itself of federal funds must meet these two requirements, among others.

1. A single agency must be designated to plan and, within the framework of federal rules, carry out an approved construction program.

2. Minimum standards for the maintenance and operation of hospitals that receive federal aid must be adopted.

The most logical single agency in a state is the health department. Because of the EMIC program, all of the state health departments have gained at least some experience that should be valuable in this new development. Of course, the most fortunate states are those with a background of experience acquired through the enforcement of hospital licensing laws.

If any regret is in order it lies in the failure of the states to prepare more adequately for the administration of Public Law 725. But this much appears to be certain: As direct payments to hospitals by private patients decrease and payments from public agencies increase, the responsibility of determining what are reasonable charges for services in each hospital will fall upon the "single state agency." Hence, for those departments that would remain aloof from the controversial issues of medical and hospital administration, designation as the single state agency should be avoided.

EMIC demonstrated also how delicate is the subject of medical specialization. At first glance the designation of specialists in a national or state health plan appears to be disarmingly simple. The administrator of such a plan, aided by an advisory body, is charged with the responsibility of preparing and publishing a list of those who are qualified. And the list is expected to be a duplicate of the names approved by American Specialty Boards.

The first reaction to the proposal that a public administrative agency designate specialists comes from the medical pro-

fession. The charge is made that the function is outside the province of public administration and is an unwarranted encroachment on the prerogatives of the profession. The issue appears to be one of those for which people fight and die and their friends wonder why. Up to this point the controversy seems to revolve around the issue of what agency will publish names from a list already published.

In EMIC the state agencies accepting the profession's declaration of prerogatives placed the responsibilities of designation upon the profession in the states and local areas. It was then that the realities of the situation began to assert themselves and simplicities became complexities.

The designation of specialists becomes an important matter when it is proposed that, for the same service, a specialist receive a higher fee than that of the non-specialist. In EMIC the difference amounted to 50 per cent. Higher fees for those with specialized training is generally accepted as a part of the tradition of private practice. But it has never been formalized as it must be if it becomes an accepted policy in any system of organized payment.

The obstacle to the designation of specialists, and, therefore, to the payment of higher fees, is seen in the informality of specialization in the United States. There are fifteen American Specialty Boards and the standard of each one is high, but this does not mean that a physician who specializes must be approved by the particular Board. Thus, in the same community there may be an approved specialist, another physician not approved but nonetheless specializing, and a third physician not approved but specializing to the extent of 50 per cent of his practice. Are all to be given approval and, if so, what standards should replace those of the American Specialty Boards? It was in the face of such realities that the prerogative of designating specialists was pushed into the background. The whole experience has had its sobering effects and EMIC has demonstrated the need of a new approach to the problems of payment and their relation to the specialization of practice. The problems are inherent regardless of whether a national or state plan under government or private auspices is being considered.

One of the phenomena of national state and local administration is the movement of criticism from the bottom to the top. Inflexible central administration in the state can be as uncompromising as this type of administration for the nation. In a state where the severe denunciations of central administration by the Children's Bureau are most pronounced it is not unusual to hear local administrators make the same criticism of rigid central administration in the state. The subject warrants attention because in too many cases it is assumed that the problems faced by EMIC would be solved with ease if the state, rather than the nation, were the basic unit of administrative authority. The assumption and the evidence are not in accord.

Considering the administrative problems that faced EMIC, it is very doubtful that they would be less acute if a like program or an expanded health program were limited to a state. Almost any state, and certainly any populous state, would be forced to adopt either a flat fee schedule regardless of geographic area or the qualification of the physician, or a fee schedule that would vary according to these two factors. As stated, the policy of EMIC was to vary the fees according to qualifications but not according to rural or urban practice. As a result, the basic obstetrical fee of $50 met with a fairly favorable response among rural physicians. However, it is much less likely that rural physicians would look with favor on a higher fee

for a service rendered by a general practitioner in an arbitrarily defined urban community. In the public mind, higher fees are usually associated with higher quality. It is fairly certain, therefore, that pressure would be exerted by the profession in the smaller communities for a flat fee at the level of urban payment.

What has been said also about the designation of specialists would not become a less acute problem under a state system or a grant-in-aid program. This statement is not made in support of a federal program; it is intended to emphasize the fact that complex problems do not suddenly simplify merely because administrative authority is concentrated in a state. Nor do they simplify when the authority is voluntary rather than governmental. With respect to the problems described, the voluntary plans have contributed little.

One final example of lessons from EMIC will be presented; many others will be included in a forthcoming report of a field study.* The example involves the quality of service and the methods that might be used to improve it. The EMIC program raises the old question of whether the chief dependence should be placed upon education or regulation. And the answer appears to be "both." Regulation is necessary for the improvement of facilities; with respect to medical service it is a doubtful procedure in a long-range program. Under the pressure of time, a divided fee for obstetrical care, as a way to assure or increase antepartum and postpartum care, may be justified. But in a continuing program improved services based upon sound public and professional educational efforts generate less antagonism and create fewer administrative problems. As a sidelight upon the future of obstetrical care in the United States, it is significant that hospital facilities have been improved and, further, that those expectant mothers who have had an experience with a high quality of care expect that type of service and are critical unless it is received.

The many administrative lessons in EMIC will be valuable or valueless according to the outlook of public health administrators. The present period is one of indecision in spite of the Official Statement adopted by the American Public Health Association in 1944.* As long as the indecision persists, the type of experience provided by EMIC will be viewed negatively, *i.e.*, adverse experience will be emphasized as reasons why health departments should "stick to their knitting," enlarging, perhaps, but not changing the forms of their work. If this describes the position of state and local health departments it is quite understandable that EMIC should be viewed as an unwanted burden forced upon them by the war. Whether the position is a realistic one and in the interest of adequate health administration is another matter.

Somewhere in the structure of state administration there must be preparation for medical and hospital administration. One event has already occurred and certain responsibilities of hospital administration are being placed upon state health departments. But there are other events involving medical administration that are already over the horizon. It is a safe prediction that legislation for disability compensation will be enacted in many states, and good administration requires that an official agency issue the necessary certificates of incapacity. Will state health departments take the position that this is a task that is to be performed by departments of unemployment compensation?

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* To be published by the Bureau of Public Health Economics of the School of Public Health, University of Michigan. The study was made possible through grants of funds by the Field Foundation and the New York Foundation.

* Medical Care in a National Health Program. *A.J.P.H.*, 34, 12:1252 (Dec.), 1944.

If so, departments of unemployment compensation must develop their own system of state and local medical administration. If disability compensation, like workmen's compensation in the past, expands to include medical service for those disabled, it is unlikely that this type of medical administration will be relinquished to state health departments.

It is useless to adopt resolutions of protest against the multiplicity of health or medical administrative agencies without taking positive steps to prevent predictable duplications. Also on the horizon of health legislation are many other state and national proposals for medical and hospital care. Whether attention be centered upon a bill sponsored by Senator Wagner or Senator Pepper or Senator Taft, the characteristic that is common to all proposals is the complexity of administration. It was to the processes of administration that EMIC made distinct contributions; the lessons of EMIC assume greater importance when the interpretations are made in the light of impending events.

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Next Steps in Industrial Hygiene Research*

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THE field of industrial hygiene research is as wide as the scope of human activity. Protection of human beings from hazards of their occupational environment exacts research demands which are highly diversified and extremely complex. This complexity is emphasized because the work is not related to a single disease entity, with specific manifestations, causes and cures. It is further complicated because the industrial scene is never static.

Just after the turn of the century it became increasingly apparent to industrialized countries that it was poor social and business economy to subject workers to avoidable industrial hazards. Following each war there has been a wider recognition of this utilitarian value of industrial hygiene research.

Industrial hygiene research is thus so unlimited in scope that one is in a dilemma even when he tries to draw a distinction between industrial hygiene research and general public health research, because the former covers many phases with regard to the working environment which the latter covers with reference to the general population.

In general, at present industrial hygiene research concerns itself essentially with the effect of different environmental factors on the normal worker, and may be divided into the following categories:

1. Effect of physical factors, such as abnormal temperatures, humidities, and pressures, noise, vibrations, etc., on the worker
2. Effect of posture, fatigue, rest pauses, physical fitness, infectious agents and susceptibility to disease, on the organic function of the worker
3. Effect of gases, vapors, fumes, and dust on the worker
4. Effect of radiations and nuclear particles on the worker

ENVIRONMENTAL PHYSIOLOGY

Numbers 1 and 2 above are usually discussed under the general term of environmental physiology.

The extent to which research has been undertaken in the United States on environmental physiology has never been on a par with its importance. It is odd that a country with industry as technologically advanced as in the United States has not devoted more effort to this field of research. The operation now and in the future of complex machinery and technical processes demands of the industrial worker a high level of functional capacity and training. For example, with the approach of a new era in air transport, aircraft engineers and designers are rapidly realizing that unless human requirements and limitations are carefully assessed, and balanced, aircraft impossible for human occupancy and control with any acceptable degree of safety may be produced. Similar con-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

siderations may be applied successfully throughout industry in the adaptation of the machine to suit men rather than the adaptation of men to suit machines.

Present physiological knowledge does not allow the full statement of man's capabilities. The physiological approach to these problems involves the study of the range of human function. For example, we must have information on what a particular task demands of the worker's motor system, sensory system, and capability for adaptation and acclimatization. This requires a knowledge of the physiological limits of these several functions. Obviously, this body of knowledge is far from complete and the establishment of such fact is the proper function of physiological research.

The integrated details of such physiological approaches border on consideration of comfort and morale, and it is probable that these factors must be studied in relation to the worker's task. For example, recent work has indicated that adjustment of industrial processes to "comfort of workers" results in a significant increase in work output. The lack of mental stress under these conditions is a morale factor of great importance in labor management relations.

TOXICOLOGY

At present toxicology may be defined as the *unfavorable* effect of drugs and chemicals on the *normal* organism in contrast to pharmacology which may be defined as the *favorable* effect of drugs and chemicals on the *diseased* organism. The interpretation of the word toxicology has been gradually changing over the past years. At one time it was devoted solely to the analysis of the stomach contents of a person who had been suspected of being poisoned by some chemical.

Later, as more information was obtained concerning the gross action of many substances (such as corrosive agents), the means for neutralizing or combating the immediate effects of such agents became a part of "toxicology." Later still, the term came to include the effects of toxic chemicals on workers in industry, the toxicological information being obtained from observations by a single individual of the industrial environment on the workers who were obviously ill.

Later, field epidemiological studies were undertaken in which the environmental exposures were quantified and physicial examinations were performed on the workers. It was thought that by the study of the data collected, the toxicity of the substances in question could be determined and engineering and medical control procedures defined. It is apparent that laboratory research had to precede such studies in order to develop methods for quantifying the environmental exposures as well as to define the early symptoms and signs of such exposures on the individual. The control procedures developed by such laboratory and field studies in the past decades are now generally accepted and, with few exceptions, the working environment has been remarkedly improved. For example, severe lead poisoning in printers and painters is relatively rare, and mercury poisoning in hatters is no longer a menace.

At present, industry and labor demand that the toxicity and potential dangers of new chemicals, or old chemicals used in new processes, be defined, and that safe medical and engineering control procedures be available before any workers are exposed. Safe control procedures are now defined as methods that will prevent not only definite illness, but also will prevent minor physiological impairments. Therefore, in the laboratory evaluation of toxic agents or harmful environmental situations, it no longer suffices to produce acute injury in the experimental

animal and then simply to tabulate mortality or gross changes. It appears imperative that in the future toxicological research should concern itself much more than heretofore with detailed studies of certain chemicals on the physiological and biochemical response of the organism, and that such effects as may be found be followed in series of homologous substances in order to discover the mechanism of action of such chemicals and the laws which control such effects. It is obvious that such detailed research cannot be performed by a single individual, but that it requires the teamwork of a number of disciplines, as pharmacologists, physiologists, biochemists, cytologists, enzymologists, and biophysicists. Such investigations are not only concerned with the effect of such chemicals on organ function, as heart action, liver and kidney function, but it has also to delve into the response of individual cells and enzymes, which includes the carcinogenicity and allergic potentialities of such chemicals.

The toxicologist must determine just what the toxic agent does to the body's economy. This means finding out how it affects the metabolism of normal body constituents, and how it affects nervous and hormonal mechanisms and the function of the various enzyme systems. In addition, he must determine exactly and in minute detail how the body reacts to the foreign agent. This means finding out how the agent is metabolized, what its end products are, and where these chemical transformations take place. Real progress in toxicology depends on carrying out such fundamental investigations. As an example, one may cite the studies done in Great Britain and in the United States on lewisite. It was found that this toxic gas had a great affinity for certain sulfur groups in protein, the —SH or sulfhydryl groups. Various vital enzymes must have these sulfhydryl groups intact, else they become inactivated. These enzymes could be protected, and the whole organism could be protected, by means of several synthetic compounds containing two sulfhydryl linkages in the molecule. One of these is BAL, whose usefulness in arsenical, as well as mercury poisoning, is becoming well known.

As another example of a thorough toxicological investigation the studies on diisopropyl fluorophosphate (DFP) may be mentioned. The most recent techniques in enzyme chemistry, pharmacology, physiology, and biophysics were used in evaluating this toxic agent in several laboratories. It was found that DFP irreversibly destroys the enzyme cholinesterase. This effect might be desirable in certain conditions like glaucoma, and clinical trials have been started. If the tests prove successful, it would provide an interesting situation, where fundamental studies of a toxic agent have disclosed therapeutically useful properties.

Unfortunately, the role of —SH groups described above is a rather isolated island of knowledge surrounded by mystery still too deep regarding the mode of action of numerous other substances which do *not* appear to exert their effects by this route. In fact, even the sulfhydryl picture has many gaps requiring further investigation, such as how the enzyme effects can be correlated with the details of pathology and the clinical course of poisoning by the agents studied. As a result, toxicology has come to depend more heavily than ever on fundamental findings concerning the properties of living matter. As the frontiers of knowledge concerning the *normal* cell are advanced the toxicologist will be given new tools for application to his particular interests. In a sense the appellation "toxicology" has lost much of its original definiteness —and, just as industrial hygiene has

come to involve essentially preventive medicine and public health in all their aspects, toxicology can be said to involve pharmacology, physiology, biochemistry and even biophysics in addition to pathology and clinical medicine.

Over the last generation, sanitary engineers have provided us with safe milk and safe drinking water. Unsafe air is probably just as much a hazard to the health of society as unsafe food and water. It is going to be a problem of the immediate future to establish satisfactory safety standards for the air we breathe and to see that these standards are enforced. These standards cannot be properly defined until fundamental research has provided them with a sound basis of fact any more than proper standards for milk could have been set before the pertinent bacteriology of the typhoid and tuberculous organism had been established. Foul air is not simply smoke-laden air or air contaminated with toxic dusts and gases in a factory. Upper respiratory diseases, including the "bad cold," cause several times as much sickness absenteeism as do occupational diseases. At present, we know that "bad colds" are contagious and that in their transmission the air we breathe plays an important part, but it remains for future research to determine how important this part is and its mechanism of transmission.

There has been work in the past—a great deal of work—done in the study of air pollution, but new research tools are steadily being developed which can be applied to its unsolved problems, and it is essential that we should continuously reconsider these problems in the light of these new tools and utilize them for what they can contribute. For example, a large proportion of the toxic and infectious particles in contaminated air are too small to be seen with the ordinary microscope. They all fall, however, within the range of the electron microscope which is directly revealing particles of molecular size. With it, we can then begin to study these extremely minute air-borne particles which by reason of their small size can gain entrance to the alveolar spaces of the lungs.

RADIATION BIOLOGY

The recent developments in atomic energy have opened up possibilities for biological research that are difficult to overestimate. However, the potential health hazards incident to the industrial and scientific development of nuclear energy are great, especially when one realizes that one of the major obstacles to the use of such energy is the protection of human beings from radiations. In addition, the development of improved electro-nuclear devices, such as synchrotrons, accelerators, and frequency modulated cyclotrons pose new health hazards as well as provide new tools for biological research. The continued expansion of the industrial use of radiations of ever increasing intensity, such as 2 million volt x-ray equipment for the study of castings, demands fundamental biological research for the protection of workers.

The preceding statements are expressions of the fact that the Public Health Service has become increasingly cognizant over the past few years of its overall responsibilities in the matter of employing these new concepts in its research in cancer, gereology, infectious diseases, physiology and toxicology, etc., as well as to work out procedures for the protection of the individual.

The public health aspects of these recent developments in nuclear energy may be considered under two general headings: (1) health physics or methods for the prevention of injury from radiations, and (2) the use of these new tools in biological research.

With regard to the protection of the individual, it is imperative that the in-

formation at present available on medical and engineering control procedures be more definitely formulated and more generally distributed. This must be accompanied by the training of personnel of various disciplines in order that an integrated application of this knowledge may be possible.

The use of these new tools in developmental and fundamental research in industrial hygiene offers great promise. At the present time, it appears that the greatest contribution which the recent developments in nuclear energy can offer to toxicological and environmental physiological research is in the field of radioactive tracers. A better understanding of the hazards involved will demand a continuation of the study of practical problems in order that safe control procedures may be established.

For many years the National Institute of Health has been conducting fundamental and applied research on the biological effects of low energy radiations, especially ultra-violet, and more recently on high energy radiations —x-ray, gamma and neutrons. As a natural sequence, the National Institute of Health has become associated with the Clinton Laboratories, operated by the Monsanto Chemical Company. This coöperative undertaking has resulted in the establishment of a Biological Research Division at Clinton Laboratories. Dr. Alexander Hollaender, principal biophysicist of the National Institute of Health, will direct the program as head biophysicist assigned to the Clinton Laboratories. He will be associated with Dr. Eugene P. Wigner, Research Director of the Laboratories. This coöperative undertaking will allow the National Institute of Health to utilize these new tools, particularly high energy radiations and radioactive isotopes, in their present and future research programs, as well as to train personnel in the increasingly important field of personnel protection.

A joint program is being developed by the National Bureau of Standards and National Institute of Health which would establish in the Washington area a radiation laboratory, including pile facilities for fundamental research in the chemical, physical, and biological aspects of high energy radiations.

Dr. Edward U. Condon and Dr. R. E. Dyer, Directors, respectively, of the National Bureau of Standards and the National Institute of Health, will present preliminary plans to the Atomic Energy Commission as soon as possible.

The Present Status of Vaccination Against Influenza*

PROPHYLACTIC EFFECT OF VACCINE

THE evidence for protective effect of vaccination against influenza with combined A and B virus vaccine resides largely in studies carried out by the Commission on Influenza, Army Epidemiological Board. In the winter of 1943-1944 an evaluation of the effect of vaccination against influenza A was made. In this study (*Am. J. Hyg.*, July, 1945) which was carried out in Army Specialized Training Program units in different universities throughout the United States, approximately 6,250 individuals received vaccine, and a similar number received control inoculations. During the epidemic of influenza A which shortly ensued, the incidence of clinical influenza in the vaccinated group was 2.2 per cent and in the control group 7.1 per cent. In all but one group the trends were similar and in some instances the ratio in favor of vaccinated individuals was considerably higher.

It is evident that complete protection was not obtained, but it must also be recognized that the 1943 studies were carried out with the first preparations of vaccine made on a large scale.

In 1945 observations on the effect of vaccination against epidemic influenza B were possible by virtue of the Army program of general vaccination. At the University of Michigan there were 600 vaccinated men in the Army unit while in a unit of another service there were 1,100 unvaccinated men. Both groups were cared for at the University Student Health Service under similar regulations for admission to hospital. During the epidemic period of November and December the incidence of admissions in the unvaccinated group was 9.9 per cent and from the vaccinated group 1.1 per cent (*J.A.M.A.*, May 25, 1946). At Yale University conditions were almost identical as to numbers and in the character of the observations. There the incidence of influenza in the unvaccinated group was 12.5 per cent and in the vaccinated group 0.5 per cent (*Am. J. Hyg.*, Jan., 1947). While neither of these studies was alternately arranged as was the one against influenza A, the results seem clear.

Evidence obtained in the 1943 studies indicates that the effect of the vaccine appears in about one week.

DURATION OF EFFECT

The duration of protective effect is not established. In all studies referred to, vaccination had been conducted only a few weeks before the onset of the epidemic. Certain observations made in institutions (*J. Exper. Med.*, Oct. 1944, *Am. J. Hyg.*, Nov. 1945) indicate that as long as 1 year after vaccination its influence was detectable, statistically, in reduced incidence of disease among vaccinated individuals, although it is by no means certain that with present procedures a satisfactory degree of resistance can be maintained for so long a period. The data indicate, however, that resistance is not limited to a period of 4 to 6 weeks, but more study is required to define the effective period.

Indirect evidence as to the effect of vaccination is seen in the stimulation

* Report of the Study Committee on Influenza Vaccination of the Subcommittee on Evaluation of Administrative Practices, Committee on Administrative Practice, American Public Health Association, April, 1947.

of antibodies and their persistence. In vaccinated groups the mean antibody response reaches its height about 2 weeks after the inoculation of the vaccine, declines approximately one-third in 4 to 5 months, and to about one-half its peak level in 1 year, although it still remains well above the prevaccination level. If, as is generally assumed, there is a correlation between the height of antibody level and resistance, these data offer support to the interpretation of an extended influence of vaccination. It cannot be accepted at present, however, that the duration of resistance is parallel to the persistence of antibody levels. Individual variation occurs and a certain proportion of individuals fail to obtain a satisfactory response. Moreover, certain individuals tend to lose antibody more rapidly than the majority. Where doses of reasonable amount are used there is little evidence that repeated inoculations at short intervals afford any advantage.

SPECIFICITY OF EFFECT

On the basis of present knowledge, influenza virus vaccine appears to have an effect of a rather specific nature against infection by influenza A and influenza B. There is no evidence that vaccine influences the incidence of common colds and other unidentified respiratory infections. Nor is the effect of vaccine as now constituted against all the possible variant strains known. There is no satisfactory evidence of protection against such an epidemic as that of 1918.

REACTIONS TO VACCINE

In a proportion of individuals influenza virus vaccine given subcutaneously elicits a reaction similar to a mild reaction to typhoid vaccine. There is commonly redness and tenderness for a few days at the site of inoculation; in recent experience involving many thousand inoculations, less than 1 per cent of those receiving the vaccine were observed to have fever. This is usually of no more than 24 hours' duration, and the aches and discomfort which accompany fever ordinarily can be controlled by the use of mild analgesics. Evidence points to the fact that the frequency of this form of reaction is related to the amount of virus present in the vaccine rather than to extraneous egg materials. The number of reactions with purified material increases as the virus content of the inoculum increases. It is suggested that material which has aged gives fewer reactions than freshly prepared material. Experience to date indicates that children are more prone to sharp febrile reactions than are adults. It might be suggested that, for children under 5 years of age, 0.1 to 0.3 ml. be given; from 5 to 10 years, 0.5 ml.; above 10 years of age the full dose, 1.0 ml.

No jaundice or central nervous system disturbances have been seen to follow influenza vaccination.

Practically all preparations at present being recommended are prepared from the allantoic fluid of the developing chick, which ordinarily is not a highly sensitizing material. It should not contain yolk, membrane, or egg white, except as this may accidentally enter in the course of production. Because of the source of material, however, the possibility of anaphylactic reactions must be kept in mind. In the large number of individuals who have been inoculated to date, such reactions have been extremely rare. Nevertheless, because they have occurred, it is imperative that careful histories be taken to determine the presence of asthma or urticarial sensitivities to chickens and eggs. Epinephrine and other antispasmodics should be readily available. It has been suggested that all individuals should receive skin tests before receiving vaccine. This seems unnecessary if other precautions are

observed. Vaccine has been given without disturbance to a good proportion of individuals who give histories of mild or moderate allergy to eggs, but skin tests should be done in these instances before vaccine is administered. If the history is marked or if there is any hesitancy about the decision, vaccine should not be given.

Data obtained up to the present time do not suggest that vaccine has a prominent sensitizing effect. This statement is based upon experience in individuals who have been vaccinated a second or third time. Further observation is required to determine whether sensitization will increase in frequency with additional inoculations.

The question has been asked recently concerning the administration of vaccine to pregnant women. There are no obvious contraindications other than those suggested above.

PREPARATION OF VACCINE

Most of the clinical evaluation in Army groups was made with vaccine material absorbed to and eluted from embryonic chicken erythrocytes. Since that time several producers of influenza vaccine have sought to eliminate unnecessary materials in the egg fluids. Various biological houses have been developing preparations by precipitation, centrifugation, etc. These products are licensed by the National Institute of Health and are required to pass similar potency tests for release. If they present adequate virus content and stability without disproportionate pyrogenic effect, they are probably prophylactically effective. Technical development of vaccine has not reached the final state and it seems unwise at the moment to seek minimal effective dosage.

GENERAL APPLICATION

Influenza A has occurred in epidemic form at intervals of 2 to 3 years; influenza B, at intervals of 4 to 5 years. It was anticipated on the basis of the preceding experience that an epidemic of influenza A would occur in the winter of 1946–1947; blustery, irregular outbreaks of the disease were identified in the spring. The time of the recurrences cannot, however, be rigidly predicted. Although the epidemics have been widespread, the clinical disease has been generally mild and of comparatively low incidence. The resistance induced by vaccination is not known to persist effectively from one season of prevalent respiratory infections to another, and the expense of the vaccination must be considered.

In view of these considerations, a recommendation for general employment of influenza vaccine by health departments is not warranted administratively at the present time.

On the other hand, in certain groups the prevention of influenza even in a mild form is to be sought. These comprise older individuals in whom the case fatality tends to be high, the debilitated or others to whom infection presents undue risk, industrial groups and essential public service personnel in whom even temporary incapacity constitutes a serious problem, and institutional groups or university students for whom facilities for care when sick are limited. The highest incidence of the disease is in children, but the mortality is extremely low.

Under these conditions the question of when vaccination should be given is open to discussion. For a large population, geographically widespread, it seems possible to gain full advantage only if vaccination is conducted in advance of the appearance of influenza A or B. On the other hand, in institutions or closely knit industrial groups, vaccination might well be withheld until evidence is obtained that epidemic influenza is occurring. However, the speed at which the disease disperses is

so great, and since the interval between inoculation and effect is at least a week, there is difficulty in carrying out the program in time to secure its advantages.

NOTE: For 1947 results, see Francis, Thomas, Jr., Salk, Jonas E., and Quilligan, J. J., Jr. Experience with Vaccination Against Influenza in the Spring of 1947. *A.J.P.H.*, 37, 7:1013 (July), 1947.

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Milwaukee's Hall of Fame

Milwaukee has an annual Hall of Health made up of a health day forum and exhibits, and an additional program prepared by the Medical Society of Milwaukee County and its Women's Auxiliary. Exhibits are prepared by health and social agencies while the City Council provides the auditorium halls.

The 1947 Hall of Health was held in May. Among the public exhibits were three by the U. S. Public Health Service on early detection and treatment of tuberculosis on a mass scale, industrial hygiene and early detection in cancer control, respectively; one by the Army Medical Corps on "dynamic convalescence"; and several by the American Medical Association on the history of American medicine, hay fever, and pneumonia; and one by the Army Air Force on protection of crews and passengers in high altitude flying.

The outstanding feature of the 1947 exhibit was provided by the Milwaukee chapter of the Wisconsin Society of Professional Engineers. This is a large oil painting, "Engineering and Health," by George E. New, Ph.D., a well known artist. The painting, seven by four feet, depicts the engineering profession's contribution to better health. The four corners symbolize the areas in which engineering has made its greatest contribution. The central figure holds a flaming torch to symbolize engineering lighting the way.

The placard accompanying the painting says in part, "Eye-saving illumination, pure water, air-conditioning, heating and refrigeration—these products of engineering skill are a part of our daily living. Engineering rears great buildings, safe and comfortable for us to dwell and work in. Through irrigation it increases the fruitfulness of our life-giving soil. It provides swift transportation and communication to bring healing aid. It makes the instruments to find and fight disease. Men in all branches of engineering turn the discoveries of science into practical use for the service of the people."

Food Values of Dairy Products as Affected by Methods of Handling in Production, Distribution, and Use*

Riboflavin, Thiamin, Vitamin A

Food and Nutrition Section

THE Committee on Milk and Dairy Products has surveyed recent research studies in an attempt to determine the effect of many factors operating between production and consumption, which may influence the ultimate nutritive values of dairy products.

Obviously, it was impossible to draw general conclusions regarding food values when several dairy products were considered and many possible affecting factors were analyzed. The only course for the committee to take was to limit the scope of the study to a consideration of a few nutrients. The following report, therefore, is based on recent literature (1940–1946) pertaining chiefly to the nutrients: riboflavin, thiamin, and vitamin A.

Each of the dairy products—milk, butter, cheese, and ice cream—is considered here from the standpoint of factors which may affect their riboflavin, thiamin, and vitamin A values. Milk as the basic product from which all dairy foods are made is considered first, from production on the farm to use in the home.

RIBOFLAVIN IN MILK

The fact that milk is an excellent source of riboflavin makes it important to know what factors in production and handling of milk affect its riboflavin content and which of these factors can be controlled to assure a maximum concentration of riboflavin in the milk. The feed of the cow is naturally a first consideration.

Ration of the Cow—The literature indicates that the riboflavin content of milk *can* be influenced by the feed of the cow. However, increasing the riboflavin intake of the cow by 30 to 50 per cent, as reported in one study, caused only a temporary increase in the concentration of the riboflavin in milk. In the same study, a good winter ration maintained milk riboflavin at pasture levels.[1] According to another report, cows transferred from winter rations to young green pasture gave *more* milk but with slightly lower concentration of riboflavin.[2] Other investigators have also shown the inverse relationship between milk yield and riboflavin content of milk. In addition, they have demonstrated that the concentration of riboflavin in milk can be increased when a dry ration is supplemented with a silage.[3]

In spite of these apparently conflicting observations, it appears likely that milk, as produced under standardized

* Report of the Committee on Milk and Dairy Products.
COMMITTEE ON MILK AND DAIRY PRODUCTS
Organized 1929. Published reports: *Year Books* 1930–1931, 1931–1932, 1932–1933, 1933–1934, 1934–1935, 1935–1936, 1936–1937, 1937–1938, 1938–1939, 1939–1940, 1940–1941, 1941–1942.

feeding and management conditions existing on modern dairy farms, is relatively uniform in riboflavin content the year around.[4] The fact that some synthesis of riboflavin in the bovine rumen has been demonstrated on specified experimental rations[5, 6] may help to explain the relatively stable riboflavin content of milk.

Light and Heat—The action of heat alone does not influence the riboflavin content of milk. However, heat and light acting together, may be responsible for considerable loss. The studies reporting such losses vary greatly in plan and procedure, a fact which makes it difficult to compare their results. In general, milk exposed either to direct sunlight out-of-doors or to relatively strong daylight indoors loses riboflavin, the amount of loss depending on the directness and strength of the light, the length of time of exposure, and the temperature and pH of the milk. Strong light, long exposure, warm temperature, and increase in alkalinity all contribute to losses of riboflavin. Typical studies are reviewed briefly.

In one study, milk in pint bottles, exposed to the direct sun (between midmorning and midafternoon) on an open porch, lost from 28 to 72 per cent of its original riboflavin content, the time of exposure ranging from 30 minutes to 3½ hours. The atmospheric temperature varied from 60 to 72° F. Control samples of milk, kept in a dark room for 24 hours or in a refrigerator for 7 days, suffered no loss of riboflavin.[7] Similar findings are reported by other investigators.[8–11]

Reports also describe research designed to answer questions covering the effect of sunlight on different types of milk, on milk in different kinds and sizes of containers, and under various other conditions of practical importance.

In general, it was found that there was less destruction of riboflavin when homogenized milk (27.6 per cent) was exposed to sunlight from 1 to 2 hours than when pasteurized (35.4 per cent) or raw milk (40.1 per cent) was subjected to the same treatment. Destruction of riboflavin in clear glass bottles ranged from 9 to 77.5 per cent (the amount related directly to time and temperature); in brown bottles from 0.6 to 5.6 per cent; in paper bottles from 0.6 to 16.9 per cent.[11]

A recently reported study combines an investigation of theoretical losses of riboflavin with observations of ordinary practices in handling milk, which may influence such losses.[12] The authors agree that losses *can* be severe but that the consumer takes greater precautions in the care of milk than is ordinarily assumed. They found, for example, that 70 per cent of all milk delivered on retail routes was removed from the doorstep or was protected from light in some manner (often by a covered receptacle) within 5 minutes after delivery. As a result, the milk lost almost no riboflavin. Only 3.3 per cent of the customers left milk exposed on doorsteps for more than 2½ hours. The authors indicate that a calculated loss of 3.25 per cent of riboflavin, after milk is delivered to the customer's doorstep, is a high estimate.[12]

Other interesting observations: The smaller the container of milk, the greater the destruction of riboflavin in a given time. Also, as would be expected, wooden cases for holding bottles protect milk from riboflavin losses more effectively than do wire cases; milk stored at the back of the delivery truck, away from light and warmth, has the advantage over milk placed near the door.

Losses enroute are negligible in general, except where milk is on a route for 5 hours or more.[12]

Another group of investigators found that chocolate milks lost riboflavin very slowly when exposed to sunlight. The average loss of riboflavin after 4 hours, for five different brands of chocolate

milk, was about 12 per cent as compared to a loss of 80 per cent for white milk.[13]

Proper care of milk in the home is important if the riboflavin content of milk is to be protected. In one study, conducted in a well lighted room, milk placed 5 feet from a window lost from 16 to 99 per cent of its riboflavin when held at 100° C. (boiling) for varying periods from 5 minutes to 1 hour and as the pH increased from 3 to 6.5.[14] When milk was allowed to simmer for 30 minutes in a covered glass pan, in a covered aluminum pan, and in an uncovered aluminum pan, the losses of riboflavin were 8 to 11 per cent; 1.1 per cent; and 10 to 12 per cent, respectively.[11] When quart bottles of milk were allowed to stand for 2 forenoon hours on a table in a light kitchen with east exposure, but not in direct sunlight, 3.2 per cent of the riboflavin was lost during the first trial and 4 per cent during the second trial.[12]

The practical application of these findings is obvious. For the most part, the properly informed consumer can protect his supply of riboflavin in milk. The need for removing milk from the doorstep ***promptly*** cannot be overemphasized.

A receptacle which is *dark* and *cool* is the alternative if the riboflavin is to be retained. When the milk is taken into the kitchen it should be refrigerated immediately and continuously in the interest of protecting it from light and from warm temperature. Cooking in covered, opaque containers is a further precaution.

The question of the effect of ultraviolet light on the riboflavin content of milk is often raised in connection with irradiation of milk to increase vitamin D content. Losses, if they occur, appear to be negligible.[15, 16]

Pasteurization—Reports, for the most part agree that there is no significant loss of riboflavin in milk as a result of pasteurization by the high-temperature-short-time method or by the holding method.[3, 17-19]

Evaporation—No loss of riboflavin was found when milk was condensed in a batch evaporator for 3 hours at 115 to 120° F. Similarly, there was no loss when milk was evaporated at 120° F. for 35 minutes and then sterilized in cans at 235° F. for 15 minutes.[20]

Drying—An extensive study of recent date on spray dried whole milk shows its riboflavin content to be equivalent to that of market milk. Samples were obtained from various areas of the world, as well as approximately one hundred samples from various parts of the United States. In addition, a much larger number of samples was obtained from a few plants. The samples of milk were studied while fresh and after various periods of storage.[21]

Storage—No loss of riboflavin is indicated in fresh milk stored for 24 hours at 40° F. in a dark refrigerator.[3] Likewise, there appears to be general agreement that no loss of riboflavin occurs in dry and condensed milks under normal storage conditions. Dried whole milk stored for 6 months at 100° F. (in air and also inert gas) showed no loss of riboflavin.[21] Condensed milk stored for different periods up to a year at 15° C. showed no riboflavin destruction. However, there were losses up to 35 per cent after 6 months' storage at 37° C.[20]

RIBOFLAVIN IN CHEESE

Processing—The content of water soluble vitamins in cheese will vary with: (1) the amount of whey retained in the curd, (2) the extent to which heat is used, (3) the methods of salting—*i.e.*, whether or not a brine bath is used, which tends to dissolve out the water soluble vitamins, and (4) the amount of exposure of ingredients to air and light, especially during heating.

The temperatures to which most cheeses are subjected are not high

enough to cause much destruction of vitamins. However, the exposure of heated ingredients in large vats and the stirring, cutting, and handling to which cheese is subjected may cause vitamin losses.

The limited data available indicate that about one-fourth to one-third of the riboflavin originally found in the milk from which cheese is made is retained in the cheese. In one study 23 per cent of the riboflavin of the milk was retained in day-old Cheddar cheese made from raw milk.[22] The percentage retention of riboflavin in day-old brick cheese was reported by the same authors to be 27.4 per cent; in blue cheese 30.1 per cent.

Pasteurization of milk, either by the holder process or by the high-temperature-short-time method had no deleterious effect on the riboflavin content of fresh Cheddar cheese, nor on the cheese during a 6 months' ripening period. Likewise, homogenization of milk, prior to making blue cheese, had no detrimental effect on the riboflavin content of that type of cheese.[22]

Storage—Sacrifice of certain of the vitamins in cheese making is possibly offset to some extent by the fact that they may be synthesized in the outer layers of some kinds of cheese during the ripening process. In one study microörganisms isolated from the surface of four kinds of cheese, synthesized considerable quantities of B-vitamins when introduced into synthetic media. Riboflavin and other B-vitamins, as determined microbiologically, appeared to increase in the surface layers of these cheeses through progressive stages of ripening.[25]

Other workers found the riboflavin content of Cheddar cheese relatively stable during the ripening process. There was a slight decline in riboflavin during the first 2 months of ripening but an equal rise during the final months to the values found in the fresh cheese.[22] Still other investigators, after analyzing different types of cheese for riboflavin and other B-vitamins, concluded that, whereas certain other B-vitamins appear to vary with the age of the cheese and the ripening process employed, the riboflavin content of cheese is relatively stable to such variations.

RIBOFLAVIN IN ICE CREAM

Storage—One report is available on the stability of riboflavin in ice cream manufactured under commercial ice cream plant conditions from fresh, whole milk, cream (40 per cent fat), cane sugar, and gelatin. Three flavors—coffee, maple, and vanilla—were used. The "over run" was 85 per cent. Samples of each of the three flavors were assayed before and after 7 months' storage at 10° F. The loss of riboflavin was 5.4 per cent.[26]

THIAMIN IN MILK

Ration of the Cow—The limited number of recent studies on this subject indicate little if any change in thiamin content of milk with fluctuation in the ration of the cow. One study reports that when cows were changed from good winter rations to early spring pasture of rapidly growing grass, there was no change in the thiamin content of the milk.[2] Investigations indicate synthesis of thiamin in the rumen.[5, 6]

Light—No evidence was found in the literature that thiamin of milk is affected by sunlight as is the riboflavin in milk. The thiamin content of experimental and market milks irradiated to produce 400 U.S.P. units of vitamin D per quart was not reduced.[15]

Pasteurization—A few studies published between 1940 and 1943 agree to a thiamin loss of about 10 to 25 per cent (with the first figure most common), in milk pasteurized by the holding process compared with that found in the original raw milk.[17, 27, 28, 29] A 1945 study in which milk was assayed im-

mediately before and immediately after pasteurization by the high-temperature-short-time process reports the small loss of 3 per cent.[19]

Boiling—A study on the effect of boiling pasteurized milk in preparing babies' formulae shows a loss of 8 per cent in thiamin.[30]

Evaporation—Milk evaporated in a batch evaporator at 120° F. for 35 minutes and then sterilized for 15 minutes in 4 and 6 ounce cans showed a loss of 27 per cent of its thiamin.[20] Earlier findings are in general agreement with these figures and indicate a loss of approximately one-third of the thiamin content as a result of evaporation procedures.[28-30] Milk condensed at 115 to 120° F. for 3 hours suffered a loss of 3.5 per cent of thiamin.[20]

Drying—The most recent study available on this subject reports the thiamin content of spray dried whole milk. The authors conclude that "whole milk powder ranks with market milk" in thiamin content.[21] Earlier studies reported from England on spray and roller dried skim milk indicate a loss of thiamin up to 10 per cent in the spray dried product and up to one-third in the roller dried product.[28, 29]

Storage—It is reported that "under good operating conditions" no appreciable loss of thiamin occurs in the storage of spray dried whole milk, packed either in air or inert gas, even when held at 100° F. for 6 months.[21] Condensed milk is reported to lose up to 29 per cent of its thiamin activity when stored for one year at 15° C., and up to 84 per cent when it is stored 4 months at 37° C.[20] In a study of several kinds of evaporated milk the amount of thiamin destruction varied with the different milks—two samples reached 50 per cent destruction after one year's storage. Loss was presumably more rapid during the first few months and eventually reached equilibrium.[30]

THIAMIN IN CHEESE

Processing—Statements made in the section on riboflavin in cheese (regarding the transfer of riboflavin from the curd to the whey in making cheese), largely hold true for thiamin. The relatively low thiamin content of cheese is predominantly due to its high solubility. In a recent study on Cheddar cheese, no actual destruction of thiamin was found to take place in the process of manufacturing the cheese. However, the retention, in the cheese, of the thiamin present in the original milk was only 8.8 per cent.[23] A study conducted in England and reported in 1945 revealed that approximately 15 per cent of the thiamin present in the milk was retained in Cheddar, Cheshire, and Stilton cheeses.[24]

Storage — Apparently, the nutrient content of cheese with respect to certain vitamins can be augmented during storage by the synthetic action of microörganisms.[25] However, in the study of Cheddar cheese cited above,[23] there was a progressive decrease in the thiamin content of the cheese with increasing ripening period. The losses in 12 months ranged from 43 to 73 per cent. Ripening at 58° F. caused greater decreases than ripening at 40° F.[23] In contrast, the 1945 English study revealed that no significant losses of thiamin occurred during ripening for periods up to 42 weeks.[24]

VITAMIN A IN BUTTER AND MILK

The differences in the vitamin A potency of summer and winter butter and milk are due largely to variations in the carotene content of summer and winter feeds. This fact is clearly evident from a nation-wide coöperative study conducted by the U. S. Department of Agriculture, the Association of Land-Grant Colleges and Universities, twenty-one state agricultural experiment stations, and one federal laboratory. Over 4,000 samples of butter were

analyzed. These extensive studies of differences in vitamin A potencies, as well as possible factors relating to the retention of such values, have been fully summarized so recently [31, 32] that no effort is made here to refer to individual reports. High points of these studies as they pertain to the subject of this report are indicated briefly.

Ration of the Cow—Of the creamery butter analyzed, 35.7 per cent was considered "winter" butter with an average vitamin A potency of about 11,000 I.U. per lb.; 64.3 per cent was butter produced in summer months when the cows were on pasture, and it had an average potency of about 18,000 I.U. per lb. No significant difference was found, in areas where tested, between the average vitamin A potency of butter on retail markets and the average of the creamery butter produced in this country.[31, 32]

The average vitamin A potency of the fat in winter butter produced in the United States was about 30 I.U. per gm. and that of summer butter was 49 I.U. per gm. On this basis, the average vitamin A potency of milk containing 4 per cent of fat may be calculated to be 1,140 I.U. per qt. for winter milk and 1,800 for summer milk.[31] "There is ample experimental evidence that vitamin A potency of milk, and also of butter made from milk, can be readily changed by increasing or decreasing the quantity of carotene in the cow's ration—any condition which tends to increase the lushness of pasture or carotene content of winter fed forages—either silages or hays—will increase the vitamin A potency of milk and butter very much." [31]

Storage—Seven state experiment stations studied the effect of storage on the vitamin A potency of butter. Samples of butter were handlde and stored under various practical conditions. The results indicate that both carotene and vitamin A are very stable in butter under the conditions tested; that little if any loss of vitamin A potency occurs during the periods that commercial butter is ordinarily stored; and that, in so far as the effect of storage is concerned, one would not expect the average vitamin A potency of the butter sold on the retail markets in this country to be significantly different from the average of the creamery butter produced in the country as a whole.[32] "This must mean that the antioxidants which occur naturally in butter are exceedingly effective in preserving its vitamin A potency." [32]

Other Conditions—Vitamin A appears relatively stable when subjected to the usual processes in the handling of milk. There is no loss of vitamin A potency due either to exposure to sunlight or to ultra-violet light in producing vitamin D milk of 400 U.S.P. units potency.[15] No evidence was found in the literature of losses in vitamin A due either to the short-time-high-temperature pasteurization process or to the holding method. Likewise, there is no evidence of loss of vitamin A as a result of evaporating milk. One extensive study on spray dried whole milk indicated that if any loss occurred during manufacture it was less than 10 per cent.[21] The vitamin A content was maintained satisfactorily during storage. After 6 months' storage at room temperature, no detectable loss of vitamin A was found in inert-gas-packed powder and only about 6 per cent in air-packed powder. Powder held at 100° F. for 6 months was found to lose 10 to 15 per cent of its vitamin A value in inert-gas-packed powder and perhaps 30 per cent of its value in the powder packed in air.[21]

VITAMIN A IN CHEESE

Processing—Since most of the fat of the original milk is retained in cheese making, much of the fat soluble vitamin A should also be present in the finished product. One study reports the distribution of vitamin A potency

in Cheddar cheese making as follows: 85 per cent retained in the cheese, 7 per cent in the whey, 8 per cent unaccounted for. These figures apply to both carotene and vitamin A. The authors suggest that losses probably occurred in the adherence of milk fat to containers and equipment during processing.[33]

Storage—No losses were noted in vitamin A potency when Cheddar cheese was stored for nearly one year. The carotene content showed a slight increase while the vitamin A content was quite constant.[33]

In certain mold ripened cheeses, it appears possible that some synthesis of vitamin A takes place since food tables show vitamin A values higher than can be accounted for by the vitamin A found in the milk from which the cheeses originated. One experimental study on blue cheese indicates no change in its vitamin A value during aging.[34]

CAROTENE AND ICE CREAM

Storage—According to one study (quoted above under the discussion of riboflavin), ice cream showed a loss of carotene during storage which amounted to 15.7 per cent.[26]

SUMMARY

From the foregoing discussion it is evident that it is impossible to generalize on the all-round stability of the nutrients contained in dairy products as they are subjected to the varied conditions which prevail in the handling of the products from production to consumption. However, it is possible to indicate in broad terms the relative stability of specific nutrients. It may be stated, for example, that riboflavin is remarkably stable except when acted on by light; this photo-chemical reaction is accelerated by heat. Thiamin is somewhat less stable to heat than riboflavin but is not influenced by the light-heat combination. Neither the riboflavin nor the thiamin content of milk is strongly affected by the feed of the cow. The vitamin A value of dairy products, on the other hand, depends to a great extent on the carotene content of the cow's ration; in general, however, it remains stable during ordinary processing and handling of the products.

REFERENCES

1. Johnson, P., Maynard, L. A., and Loosli, J. K. The Riboflavin Content of Milk as Influenced by Diet. *J. Dairy Sci.*, 24:57 (Jan.), 1941.

2. Holmes, A. D., Jones, C. P., and Wertz, A. W. Ascorbic Acid, Riboflavin and Thiamine Content of Cow's Milk—Influence of the Ration. *Am. J. Dis. Child.*, 67:376 (May), 1944.

3. Theophilus, D. R., and Stamberg, O. E. The Influence of Breed, Feed and Processing on the Riboflavin Content of Milk. *J. Dairy Sci.*, 28:259 (Apr.), 1945.

4. Holmes, A. D., and Holmes, J. O. Uniformity of Riboflavin Content of Milk Produced Under Standardized Conditions. *Am. J. Dis. Child.*, 66:607 (Dec.), 1943.

5. Lardinois, C. C., Mills, R. C., Elvehjem, C. A., and Hart, E. B. Rumen Synthesis of the Vitamin B Complex as Influenced by Ration Composition. *J. Dairy Sci.*, 27:579 (July), 1944.

6. Hunt, C. H., Kick, C. H., Burroughs, E. W., Bethke, R. M., Schalk, A. F., and Gerlaugh, P. Studies on Riboflavin and Thiamine in the Rumen Content of Cattle. *J. Nutrition*, 21:85 (Jan.), 1941.

7. Peterson, W. J., Haig, F. M., and Shaw, A. O. Destruction of Riboflavin in Milk by Sunlight. *J. Am. Chem. Soc.*, 66:662, 1944.

8. Holmes, A. D., and Jones, C. P. Effect of Sunshine Upon the Ascorbic Acid and Riboflavin Content of Milk. *J. Nutrition*, 29:201 (Mar. 10), 1945.

9. Ziegler, J. A. Photochemical Destruction of Vitamin B_2 in Milk. *J. Am. Chem. Soc.*, 66:1039, 1944.

10. Stamberg, O. E., and Theophilus, D. R. Loss of Riboflavin in Milk Due to Sunlight. *Milk Dealer* (May), 1944.

11. Stamberg, O. E., and Theophilus, D. R. Photolysis of Riboflavin in Milk. *J. Dairy Sci.*, 28:269 (Apr.), 1945.

12. Josephson, D. V., Burgwald, L. H., and Stoltz, R. B. The Effect of Route Delivery on the Flavor, Riboflavin and Ascorbic Acid Content of Milk. *J. Dairy Sci.*, 29:273 (May), 1946.

13. Shetlar, M. R., Shetlar, C. L., and Lyman, J. F. Determination of Riboflavin in Chocolate Milk and the Comparative Photochemical Losses of Riboflavin in Chocolate and Whole Milk. *J. Dairy Sci.*, 28:873 (Nov.), 1945.

14. Williams, R. R., and Cheldelin, V. H. Destruction of Riboflavin by Light. *Science*, 96:22 (July 3), 1942.

15. Fuhr, I., Dornbush, A. C., and Peterson, W. H. The Effect of Ultra-Violet Irradiation on the Vitamin A, Carotene and Riboflavin Content of Milk. *J. Dairy Sci.*, 26:643 (July), 1943.

16. Ziegler, J. A., and Keevil, N. B. Photochemical Destruction of Riboflavin in Milk and Losses During Processing. *J. Biol. Chem.*, 155:605 (Oct.), 1944.

17. Houston, J., Kon, S. K., and Thompson, S. Y. The Effect of Commercial Pasteurization and Sterili-

zation on the Vitamin B_1 and Riboflavin Content of Milk as Measured by Chemical Methods. *J. Dairy Research*, 11:67 (Jan.), 1940.

18. Holmes, A. D. Effect of Pasteurization on the Riboflavin Content of Milk. *J. Am. Dietet. A.*, 20: 226 (Apr.), 1944.

19. Holmes, A. D., Lindquist, H. G., Jones, C. P., and Wertz, A. W. The Effect of High-Temperature-Short-Time Pasteurization on the Ascorbic Acid, Riboflavin and Thiamine Content of Milk. *J. Dairy Sci.*, 28:29 (Jan.), 1945.

20. Henry, K. M., Houston, J., Kon, S. K., and Thompson, S. Y. The Effects of Commercial Processing and of Storage on Some Nutritive Properties of Milk. Comparison of Full-Cream Sweetened Condensed Milk and of Evaporated Milk with the Original Raw Milk. *J. Dairy Research*, 13:329 (Mar.), 1944.

21. Sharp, P. F., Shields, J. B., and Stewart, A. P. Nutritive Quality of Spray-Dried Whole Milk in Relation to Manufacture and Storage. *Proc. Inst. Food Tech.*, 1945, pp. 54–57.

22. Irvine, O. R., Bryant, L. R., Sproule, W. H., Jackson, S. H., Crook, A., and Johnstone, W. M. The Retention of Nutrients in Cheese Making. *Sci. Agr.*, 25:817, 833, 845 (Aug.), 1945.

23. Evans, E. V., Irvine, O. R., and Bryant, L. R. Thiamine in Cheddar Cheese Made from Raw and Pasteurized Milk. *J. Nutrition*, 32:227 (Sept.), 1946.

24. Dearden, D. V., Henry, K. M., Houston, J., Kon, S. K., and Thompson, S. Y. A Study of the Balance of Certain Milk Nutrients in the Making of Cheddar, Cheshire and Stilton Cheeses, and of Their Fate During the Ripening of the Cheeses. *J. Dairy Research*, 14:100, 1945.

25. Burkholder, P. R., Collier, J., and Moyer, D. Synthesis of Vitamins by Microörganisms in Relation to Vitamin Content of Fancy Cheeses. *Food Research*, 8:314 (July-Aug.), 1943.

26. Holmes, A. D., Kuzmeski, J. W., and Canavan, F. T. Stability of Vitamins in Stored Ice Cream. *J. Am. Dietet. A.*, 22:670 (Aug.), 1946.

27. Kendall, N. Thiamine Content of Various Milks. *J. Pediat.*, 20:65 (Jan.), 1942.

28. Kon, S. K. The Chemical Composition and Nutritive Value of Milk and Milk Products. *Chem. & Ind.*, 62:478 (Dec. 18), 1943.

29. Kon, S. K. Relative Nutritive Value of Different Forms of Milk. *Nature*, 148:607 (Nov. 22), 1941.

30. Knott, E. M. Thiamine Content of Milk in Relation to Vitamin B_1 in Requirement of Infants. *A.J.P.H.*, 32:1013 (Sept.), 1942.

31. Vitamin A in Butter. U. S. Department of Agriculture: *Misc. Pub. No. 571* (July), 1945.

32. Cary, C. A., and Hartman, A. M. The Nutrients in Milk. Unpublished material.

33. Higuchi, K., Price, W. V., and Peterson, W. H. Relation of Corn and Alfalfa Silage to the Quality of Cheese and Its Carotene and Vitamin A Content. *J. Dairy Sci.*, 29:157 (Mar.), 1946.

34. Todhunter, E. N., Roderuck, C. E., and Golding, N. S. The Vitamin A Value of Roquefort Type Cheese. *J. Dairy Sci.*, 25:1023 (Dec.), 1942.

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Walter Reed Bust in the Hall of Fame

The American Society of Tropical Medicine is sponsoring a campaign for funds in order to have a bust of the late Dr. Walter Reed placed in the Hall of Fame. This niche has heretofore remained empty for lack of funds, although Dr. Reed was elected to the Hall of Fame in 1945. It is hoped to have the funds collected and the sculpture completed so that the dedication ceremonies may be part of the International Congress for Tropical Medicine and Malaria to be held in Washington in the spring. The evening of May 12, 1948 has been set aside for the ceremony.

It is estimated that about $6,000 will be needed. Contributions should be sent to Norman H. Topping, M.D., Secretary-Treasurer of the American Society of Tropical Medicine, National Institute of Health, Bethesda 14, Md.

Recommended Procedure for the Bacteriological Examination of Shellfish and Shellfish Waters*

Laboratory Section

INTRODUCTION

This report replaces the recommended methods of procedure for the bacteriological examination of shellfish and shellfish waters (A.P.H.A., 1943) and has been revised in accordance with the experience of the committee and others who have studied the procedure during the past three years. The committee consisted of: C. A. Perry (resigned), C. T. Butterfield, Leslie A. Sandholzer, Herman Sommer, F. W. Tanner, Cornelius B. Kelly, Charles E. Renn, and J. Gibbard, *Chairman*.

In general, the technique outlined for the bacteriological examination of shellfish is based on recognized procedures which have been developed for the examination of water and sewage. It should, however, be pointed out that there is some evidence not fully confirmed that some coliforms found in salt water may be of little sanitary significance. Furthermore, it is realized that the biology of some shellfish particularly in reference to their normal bacterial flora is not clearly understood. Despite this lack of data, there is every justification for the use of recognized bacteriological procedures for the determination of the coliform group of bacteria, for in the great majority of cases the sanitary engineer can demonstrate beyond doubt that the presence of coliform organisms is directly related to pollution of human or animal origin.

In this revised procedure, the short methods previously suggested for estimating *Escherichia coli* have been eliminated as unsatisfactory. The chlorine rinse has also been dropped for the same reason. Methods for the examination of frozen shellfish and shellfish products have been included. Mechanical disintegrators have been recommended for preparing shellfish samples and the older procedure of cutting and shaking the shellfish has been discarded.

Shellfish Defined

The term shellfish as herein used refers to any fresh or frozen edible bivalve mollusc, either shucked or in the shell and any fresh or frozen or incompletely sterilized products thereof.

Coliform Group

For the purpose of examination of shellfish and shellfish waters, the coliform group shall be considered as including all organisms which, upon transfer from a positive presumptive test (gas-positive in lactose broth), show fermentation with gas formation in lactose medium containing 0.00133 per

* Revision of Recommended Methods of Procedure. Report of the Standard Methods Committee.

STANDARD METHODS COMMITTEE FOR THE EXAMINATION OF SHELLFISH
Organized 1938. Published reports: *Year Book* 1941–1942, *A.J.P.H.*, May, 1943, Official Report of the A.P.H.A., pamphlet, 1944.

cent of brilliant green and 2.0 per cent of bile (brilliant green lactose bile broth).

In most cases, the determination of the coliform group will provide sufficient evidence as to the safety of the shellfish under consideration. However, laboratories charged with the responsibility of examining samples of shellfish other than those known to have been freshly taken from growing areas would be well advised to complete all tests for *Escherichia coli* according to the procedure recommended in the A.P.H.A. *Standard Methods for the Examination of Water and Sewage*, 9th Ed., under "Selective Agar Media for Differentiation," p. 227 and "Differentiation of Coliform Organisms," pp. 228–231. Such examinations may become the basis of legal action and complete tests are recommended.

I—BACTERIOLOGICAL EXAMINATION OF SHELLFISH WATERS

A—Collection and Transportation of Samples

Samples of water from shellfish areas shall be collected at various stages of the tide and shall also be collected at different depths if there is any indication of variations in salinity or pollution due to stratification. The samples shall be collected in sterile bottles and shall be fully protected against contamination both during sampling and after collection. They should be kept at a temperature at or below 10° C. (50° F.) and shall be examined as soon as possible after collection. The samples should preferably be tested within 12 hours from the time of collection and in no case shall samples which have been held for more than 30 hours be tested.

B—Field Record

A record of environmental conditions made at the time of collection of the sample should accompany all water samples collected during the course of a survey to establish the sanitary condition of shellfish waters. This record shall include the following essential information:

Date and hour of collection
Exact location of the sampling station

Where possible the following supplementary data shall be obtained in order to interpret the bacteriological findings.

1. State of the tide
2. Direction and velocity of currents
3. Direction and velocity of the wind
4. Temperature and density of the water
5. Depth of the water and depth at which the sample was collected
6. Temperature of the air
7. Notes on any unusual conditions which may affect the sanitary quality of the water
8. Record of rainfall in the immediate past

A suitable form to be used for reporting this information may be found in Sec. IV A.

C—Procedure

Examination for bacteria of the coliform group shall be made by primary inoculation into plain lactose broth (see Sec. III D) with incubation at 35°–37° C. After incubation for not more than 48 hours definite gas formation shall be recognized by the presence of visible gas in the upper end of the inverted fermentation tube or by the presence of effervescent gas bubbles visible only when the tube is shaken.

Detailed instructions on the collection of samples and inoculation of media may be obtained from the A.P.H.A. *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 190, et seq.

1. Inoculation
   Inoculate—
   a. Not less than 3 tubes with 10 ml. of undiluted water
   b. Not less than 3 tubes with 1 ml. of undiluted water

c. Not less than 3 tubes with 1 ml. of a 1 in 10 dilution of water (in 1 per cent salt solution)

(These dilutions may be altered to suit the degree of contamination of the water, but in no case should less than three dilutions be inoculated.)

2. Presumptive Test for Coliform Organisms

Incubate tubes for 18–24 hours at 35°–37° C. Record gas formation in each tube.

a. *Gas present*—Any amount of definite gas constitutes presumptive evidence of the presence of coliform bacteria and must be confirmed as described in step 3 below.

b. *No gas*—Incubate negative tubes an additional 24 hours making a total of 48 hours incubation. Record gas formation.

(1) Gas present in any amount constitutes a doubtful test which must always be confirmed (step 3).

(2) Absence of any gas after 48 hours of incubation constitutes a final negative test.

3. Confirmation

All positive gas tubes must be confirmed for bacteria of the coliform group.

Transfer a loopful (3 mm. diameter loop) of culture from the gas-positive primary lactose broth fermentation tube to one of brilliant green lactose bile broth (see III E).

a. Any amount of definite gas formation within 48 hours at 35°–37° C. constitutes a positive test for bacteria of the coliform group.

b. Absence of gas after 48 hours' incubation constitutes a negative test for bacteria of the coliform group.

4. Differentiation of coliform organisms

Conduct all tests for relative density of species of the genera *Escherichia* and *Aerobacter* according to the procedures recommended in the A.P.H.A. *Standard Methods for the Examination of Water and Sewage*, 9th Ed., under "Selective Agar Media for Differentiation," p. 227 and "Differentiation of Coliform Organisms," pp. 228–231.

D—Expression of Results

The numbers of bacteria of the coliform group shall be expressed as the most probable numbers (M.P.N.) per 100 ml. of sample. The M.P.N. shall be determined from the table of most probable numbers given in Sec. V.

II—BACTERIOLOGICAL EXAMINATION OF SHELLFISH

A—Collection and Transportation of Samples

Individual containers of shellfish samples shall be marked for identification and the same mark shall be placed in its proper place on the descriptive form which accompanies the sample.

Shellfish samples shall be kept at or below 10° C. (50° F.) until examined, but under no condition shall they be permitted to come in direct contact with ice. A sample shall be considered unsatisfactory which has been improperly handled after collection. Samples of shellfish should preferably be tested within 12 hours from the time of collection and in no case should they be examined if they have been held for more than 30 hours.

Shell Stock

In general, ten or more shellfish, judged to be representative of the lot under examination shall be selected and prepared for transportation to the laboratory. Oysters and hard-shell clams (quahaugs) should have deep bowls, unbroken lips, and shells tightly closed. The quantity of shellfish submitted shall be sufficient to produce not less than 200 ml. of shell liquor and ground meats. The shellfish shall be placed in a suitable sterilized container such as a can with watertight lid or a canvas or waterproof bag. All shellfish for bacteriological examination shall be handled aseptically.

Shucked Stock

Samples of shucked shellfish may be submitted in the original container or samples may be taken either from the container or at steps in process of shucking or packing, using sterilized forceps. The ordinary glass top Mason jar, suitably sterilized, is a satisfactory container for transporting samples of shucked shellfish. Not less than 200 ml. shall be taken as a sample.

Frozen Shellfish and Frozen Shellfish Products

If the package of shellfish or shellfish products is of reasonable size, (16 ounces or less) one or two packages may be taken as a sample. Samples from larger blocks may be taken by coring with a suitable instrument, similar to a cork borer, 1 to 1½ in. in diameter, using sterile technique.

Depending on circumstances, the sample should be taken from one or many blocks but in any event, a sufficient number of cores shall be taken to obtain a total volume of not less than 200 ml. of sample. The cores may be transferred to sterile glass-top Mason jars for transportation to the laboratory.

B—Field Record

A record of environmental conditions made at the time of collection of the sample shall accompany all shellfish samples taken directly from growing waters. The record shall include the following essential information:

Exact location and depth from which they were collected
Date and hour of collection

Where possible the following supplementary data should be obtained:

1. State of tide
2. Temperature of the water
3. Density of the water
4. Whether there has been heavy, moderate, or very little rain during or immediately preceding the period of collection
5. Careful notes on any unusual sources of pollution such as boats, privies, sewers, pasture lands, animals, etc., which might affect bacteriological results

When samples are collected from packing plants or from the market, records shall be made of:

1. Date and hour of collection
2. Name and address of the place from which samples were collected
3. Exact location of the water in which the shellfish were dug
4. Identification of the digger, shipper and reshipper, and the respective dates on which these transactions took place
5. Conditions of storage prior to collection of the sample
6. Sanitary conditions in the packing plant
7. Temperature at which shellfish were being held

Sample forms to be used for the submission of these data may be found in Sec. IV B and C.

C—Preparation of Sample for Examination

1. Unopened Shellfish

a. Washing Shells—Scrape off excessive growth and loose material from the shellfish and scrub with a stiff brush in running water of known purity until shells are clean and free of all mud, especially in crevices at junction of shells.

The hands of the examiner should be thoroughly washed with soap and water and the brush used for scrubbing the shells should be sterilized by boiling or autoclaving. Place the cleaned shellfish on clean paper towels and dry in the air.

b. Removal of Shell Content—Before starting the examination and between samples, the hands of the examiner should be thoroughly scrubbed with soap and water and should then be rinsed with 70 per cent alcohol. The use of rubber gloves is recommended, although not necessary if the hands have been properly cleaned.

(1) Oysters—Oysters may be opened with an oyster knife or other suitable instrument (prefer-

ably one piece metal—Appendix I) which has been sterilized by flaming, immersing for 3 minutes in boiling water, or by autoclaving.

Hold the oyster in the left hand, with the deep shell on the bottom. The point of the oyster knife may be inserted between the shells on the ventral side (at the right of the examiner) about one-fourth the distance from the hinge to the bill; or entry may be made at the bill after making a small opening with nibbling forceps.

Cut the adductor muscle from the upper flat shell and pry wide enough to drain the shell liquor into the sample bottle. The upper shell may then be pried loose at the hinge by holding the lower shell down with the oyster knife and at the same time using the knife as a lever to pry off the upper shell. The removal of the shell is the most difficult part of the procedure and calls for careful technique to avoid contact of shell liquor or meats with the hands.

Transfer the entire shell contents to a sterile glass or rubber stoppered bottle or jar graduated at 200 and 400 ml. The ordinary glass-top snap-lock Mason canning jar has been found to be quite suitable. Open a sufficient number of shellfish to obtain 200 ml. of shell liquor and whole meats, except that not less than six shellfish should constitute a sample.

(2) Other Shellfish—In general, the technique for opening other shellfish is similar to that for oysters, except that a thinner flat blade will probably be found to be more effective. Quahaugs need to be opened by squeezing the edge of the knife between the shells, hence the necessity for carefully washing and sterilizing the hands. Mussels may be entered with the point of knife at the point where the byssal threads emerge. Soft-shell clams are relatively easy to penetrate and remove from the shell.

c. Grinding—Add an equal amount of sterile 1 per cent salt solution to the shellfish and liquor contained in the glass jar and transfer to the disintegrator (Appendix II) which has previously been sterilized by immersion in boiling water for 3 minutes or by autoclaving. Grinding for 3 minutes is usually sufficient to produce a homogeneous mixture. The sample should be inoculated immediately, but if there is any delay it should be thoroughly shaken immediately before inoculation.

2. Shucked Shellfish and Frozen Shellfish and Shellfish Products

The examination of shucked shellfish, frozen shellfish, or shellfish products shall be made in an analogous manner to that for shell stock, that is, 200 ml. of the sample shall be added to 200 ml. of 1 per cent salt solution and ground as in step c above.

D—Examination for Members of the Coliform Group

Examination of shellfish shall be made in a manner similar to that described for the examination of shellfish water samples.

1. Inoculation

Using plain lactose broth fermentation tubes, inoculate:

a. Each of 5 tubes with 2 ml. from sample as prepared under Section C.

b. Each of 5 tubes with 1 ml. from a 1 in 10 dilution of the sample (2 ml. prepared sample C plus 8 ml. of sterile 1 per cent salt solution).

c. Each of 5 tubes with 1 ml. from a 1 in 100 dilution of the shellfish sample (1 ml. of 1 in 10 dilution plus 9 ml. of sterile 1 per cent salt solution).

(Higher dilutions may be necessary in the examination of shellfish from sources highly polluted.)

2. Presumptive Test for Coliform Organisms

Incubate tubes for 18–24 hours at 35°–37° C. Record gas formation in each tube.

a. Gas present—Any amount of definite gas constitutes presumptive evidence of the presence of coliform bacteria and must be confirmed as described in step 3 below.

b. No gas—Incubate negative tubes an additional 24 hours making a total of 48 hours incubation. Record gas formation.

(1) Gas present in any amount constitutes a doubtful test which must always be confirmed (step 3).

(2) Absence of any gas after 48 hours of incubation constitutes a final negative test.

3. Confirmation

All gas-positive tubes must be confirmed for bacteria of the coliform group, as described under Section 3 in the procedure for the examination of shellfish waters, by transfer to brilliant green lactose bile broth.

4. Differentiation of Coliform Organisms

Tests for relative density of species of the genera *Escherichia* or *Aerobacter* shall be made by the method described in Section 4 in the procedure for the examination of shellfish waters. Any laboratory charged with the responsibility of examining shellfish and desirous of determining the relative density of the various members of the coliform group should adhere strictly to the prescribed procedure. Such examinations may become the basis of legal actions and short cuts are not recommended.

E—Colony Counts

A standard colony count of shellfish samples has been found to be of value as an index of general sanitation and refrigeration.

Colony counts shall be made by inoculating various amounts of sample, as prepared under Section II—A, above, into the tryptone glucose extract agar (see Sec. III F) and incubating plates at 35°–37° C. for 48 hours.

The method of preparing plates and making the counts shall be that recommended by the A.P.H.A. *Standard Methods for the Examination of Dairy Products*, except that milk shall not be added to the medium (*Standard Methods for the Examination of Dairy Products*, 8th Ed., 1941).

F—Expression of Results

The numbers of bacteria of the coliform group shall be expressed as the most probable numbers (M.P.N.) per 100 ml. of sample. The M.P.N. shall be determined from the tables of most probable numbers (Sec. V).

III—MEDIA—COMPOSITION AND PREPARATION

A—Materials

The materials used for the preparation of media shall be as described in *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 184.

B—Adjustment of pH

The method of adjustment of reaction shall be as given in *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 185.

C—Sterilization

The method of sterilization of media shall be as given in *Standard Methods for the Examination of Water and Sewage*, 9th Ed., p. 185.

D—Lactose Broth:

Beef Extract	3.0 gm.
Peptone	5.0 gm.
Lactose	5.0 gm.
Water (Distilled)	1.000.0 ml.

Adjust the reaction so that the pH after sterilization will be between 6.7 and 7.1. Place in fermentation tubes and sterilize in the autoclave at 15 lb. for 15 min. (121° C.). Cool rapidly after removal from the autoclave.

A 10 or 20 per cent solution of lactose in distilled water may be prepared and sterilized in the autoclave (15

lb. for 15 min., 121° C.), or by heating in an Arnold sterilizer at 100° C. for 1½ hours. Add this solution to sterile broth (without lactose) in amount sufficient to make an 0.5 per cent lactose solution, tube with proper precautions for preserving its sterility, and sterilize at 100° C. for 30 minutes.

It is permissible to add by means of a sterile pipette directly to a tube of sterile nutrient broth enough of the lactose solution to make the required 0.5 per cent concentration. The tubes so made shall be incubated at 35°–37° C. for 24 hours, as a test for sterility before they are used.

E—Brilliant Green Lactose Bile Broth (2 per cent)

Dissolve 10 gm. of peptone and 10 gm. of lactose in not more than 500 ml. of distilled water. Add 200 ml. of fresh ox bile or 20 gm. of dehydrated ox bile dissolved in 200 ml. of distilled water. No dehydrated ox bile shall be used which has a pH of less than 7.0. Make up with distilled water to a total of at least 975 ml. and adjust the reaction to pH 7.4. Add 13.3 ml. of a 0.1 per cent solution brilliant green (certified for culture media) in water; make up to a total of 1,000 ml. and filter through cotton.

Distribute the medium in tubes provided with inverted vials. Sterilize in the autoclave at 15 lb. for 15 min. (121° C.).

The reaction after sterilization shall be not less than pH 7.1 and not more than pH 7.4.

F—Tryptone Glucose Extract Agar

	Per cent
Agar, best quality, not oven dried	1.5
Beef Extract	0.3
Tryptone	0.5
Glucose	0.1

Reaction—pH 6.6 to 7.0

(The above media may be purchased in dehydrated form from firms of known reliability. The preparation of these media should conform to directions given above. Dehydrated media are recommended in the case of Eosin Methylene Blue Agar and Brilliant Green Lactose Bile Broth.

Large laboratories obliged to make their own media would be well advised to run comparative tests from time to time, using one of these well known commercial dehydrated products for the comparison.)

IV—FIELD RECORD FORMS

A—WATER FROM SHELLFISH AREAS

DESCRIPTIVE DATA—WATER SAMPLES

Bay ..... Town ..... County ..... State ..... Date Coll. .....

Air Temp. Precipitation last 24 hours

Lab. No.	*Sta. No.*	*Identification No.*	*Location*	*Time*	*Cur.*		*Tide*	*Wind*		*Water*		*Depth*	
					Dir.	*Vel.*		*Dir.*	*Vel.*	*Temp.*	*Sp. gr.*	*Water*	*Samp.*

Notes on possible sources of pollution may be made on the other side.

Collected by .....

B—Shellfish from Shellfish Areas

Descriptive Data—Shellfish Samples from Growing Areas

Identification No. ..... Date Collected ..... Time ..... Lab. No. .....

Bay ..... Bed .....

Location .....

Town ..... County ..... State .....

Type of Shellfish .....

Condition of Tide ..... Water Temp. ..... Sp. Gr. ..... Depth .....

Rainfall during last 48 hours .....

Sources of pollution .....

Make careful notes on boats, weather, towns, privies, sewers, pasture lands, etc., which might be sources of pollution.

Collected by .....

C—Shellfish from Packing Plants or Markets

Descriptive Data—Shellfish Samples—From Packing Plants or Markets

Identification No. ..... Date Collected ..... Time ..... Lab. No. .....

Place ..... No. .....

Type of Shellfish .....

Collected from .....

Bed No. ..... Bay ..... Owned by .....

Dug by ..... No. ..... Date .....

Shipped by ..... No. ..... Date .....

Reshipped by ..... No. ..... Date .....

Was the shellfish stored under proper sanitary conditions .....

Was the shellfish properly refrigerated ..... Temp. .....

Are there any other possible causes of contamination .....

Was the sample collected from a previously unopened container .....

Notes:

Collected by .....

V—Tables of Most probable Numbers

A—3 Tubes

B—5 Tubes

VI—Definitions

1. Shellfish

The term shellfish as herein used refers to any fresh or frozen edible bivalve mollusc, either shucked or in the shell and any fresh or frozen or incompletely sterilized products thereof.

2. Coliform Group

For the purpose of examination of shellfish and shellfish waters, the coliform group shall be considered as including all organisms which, upon transfer from a positive presumptive test (gas-positive in lactose broth), show fermentation with gas formation in lactose medium containing 0.00133 per cent of brilliant green and 2.0 per cent of bile (brilliant green lactose bile broth).

APPENDIX I

The Letsch oyster opener has been found useful for those who are inexperienced in opening oysters. It is essentially a heavy oyster knife powered

by a rack and pinion which forces the knife through the hinge of the oyster, severing the adductor muscle from its attachment to the top shell. The oyster may then be held by the bottom shell over the pint jar, the shell liquor drained and the bottom adductor muscle cut. The parts of the machine which come in contact with the oyster may be sterilized by flaming or immersing in 70 per cent ethyl alcohol or boiling water.

APPENDIX II

Disintegrators — The disintegrators mentioned in Section II C 1 c, page 1125, consist of the base housing a high speed motor (10,000–16,000 r.p.m.) which drives knives fitted in a cup which is placed on the top of the motor unit. These disintegrators are in production by a number of manufacturers and may be obtained from almost any laboratory supply house.

A metal cup, preferably of stainless steel or aluminum, has advantages over the glass cups usually furnished with the machine, particularly with regard to sterilization either in the autoclave or by boiling. These also may be obtained from the laboratory supply houses.

Experience with the particular make of disintegrator will dictate final establishment of grinding time. Care should be taken to avoid too long a grinding because of the danger of occlusion of excessive amounts of air in the mixture.

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Is Aviation Medicine Industrial Hygiene?*

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FOR the past century efforts have been made to bring the problems of industry, the knowledge of medicine and related sciences together for the solution of these, in the interests of both the industry, as a whole, and those individuals participating in industry.

During the period 1840–1880 attempts were made to better the lot of the working man; however, after that time stress was laid on disease prevention, *per se*, and the working man, as an individual, relegated to a secondary role. During World War I the pendulum swung from particularized disease prevention to industry as a whole. It was during this time that a system of medicine was inaugurated in the Aviation Section of the Army Signal Corps that is now called "Aviation Medicine." It was a radical departure from any previous effort of similar nature. This system was developed in 1918 for the then newly-born Air Service of the Army and has gradually developed to encompass the entire field of aviation, civil, civilian governmental agencies, and the armed services.

A small band of inspired doctors under the competent leadership of Brigadier General Theodore Lyster formulated plans for the care and treatment of aviators. They were wiser than their generation, for in my opinion no similar effort of like nature had been developed in any field of endeavor. It was the beginning, on a national scale, for the first time, of a system of medicine that would encompass the entire activities of personnel engaged in one of the arts—the art of flying.

This group of men were believed visionary and had to weather the rebuffs and hostility of those for whom they were laboring so conscientiously and intensely. They were determined in their convictions and were able to organize a research laboratory and a school for the indoctrination of others who had the temerity to follow where they had dared to pioneer.

Through the years between World War I and World War II this school—the School of Aviation Medicine, now located at Randolph Field—continued through its graduates to spread the leaven of the necessity for medical supervision over those who would learn to fly and those who had finished their training and had received their coveted aeronautical ratings. This indoctrination of Air Forces personnel early was an uphill battle and brought with it many disheartening experiences. To those of us who pioneered in this work it seemed at times that the "game was not worth the candle" and that we were "voices crying in the wilderness" of prejudice and antagonism—as is always the situation when one dares to institute an innovation, even though it is in what, at the time, and at a later date is proved to be, the best interests of the ones who

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

were its most vociferous opponents. In this uphill struggle for the recognition of Aviation Medicine, resistance came from an unexpected quarter in that we were ofttimes opposed by our own medical brethren of the Medical Department assigned to other duties than with the Air Forces. Nevertheless, Aviation Medicine being solidly founded developed and in the Services came to full fruition during World War II.

With the formation of the Division of Aeronautics in the Department of Commerce, the first director wisely ruled that the division should have a medical department. The doctors assigned to these duties were graduate flight surgeons and indoctrinated in this work in the Army. They formulated rules and regulations patterned after those of the Army but modified to meet the needs of a civilian population learning to fly but who could not be supervised as were Army personnel.

As civil airlines begans to develop, the management of these lines soon realized that medical supervision of their flying personnel was a "must" if their operations were to be successful, from the standpoint of the health of the pilots as well as that of the public that had every right to demand the ultimate for the pilots' medical care. This has paid dividends, as I know of no airline—passenger or freight—that does not have its own thoroughly organized medical department with flight surgeons to look after the especial needs of their flying personnel.

Airplane manufacturers, too, have realized the necessity for and the effectiveness of aviation medicine in connection with those engaged in flying. These large plants have their regular medical establishments to care for the needs of their employees. However, they also have doctors who have had specialized training in those problems that beset flyers—especially those engaged in test flying new types of airplanes.

Aviation Medicine is medicine, in all its phases, applied to the art or profession of flying. In its application it transcends occupational medicine and industrial hygiene, as practised. Aviation Medicine has a higher significance than these, in that it encompasses both and goes farther, considering as it does the total personality of the flyer in any and all of the environments in which he finds himself, in the air, on the ground, at work, at play, and in his relaxations. It is a full-time job and those engaged in Aviation Medicine must be especially chosen, as not everyone who would practise this type of medicine is qualified for it.

At the Schools of Aviation Medicine of both the Army and the Navy—the only organized schools in the world giving formalized training in this specialty —emphasis is laid on the selection of doctors who would become flight surgeons. This selection is made academically, militarily, physically, and psychologically. I have for years defined the flight surgeon as an outstanding doctor, a graduate of the School of Aviation Medicine who has the attributes of the family physician, lawyer, and priest, with a strong bent for psychopathological medicine. During the past war it has been necessary for me to add the term "technologist" to my definition, because of the tremendous technological advances made in aviation, and concerning which the flight surgeon must know much.

The Schools of Aviation Medicine mentioned are supplemented by their own well organized research laboratories as well as by the Aero Medical Laboratories at Wright Field, Ohio, and Bethesda, Md. In the field of civilian aviation each large airline and airplane manufacturer has its own aviation medical research laboratory. These all have for their goal the solution of many problems from the human standpoint with which the profession is faced, as

aviation approaches the era of supersonic speeds, illimitable altitudes and interplanetary communication that staggers the imagination.

It might be well to detail how the flight surgeon works in this system of medicine and how it is applied in the Military Services. Prior to World War II all medical officers assigned to Air Forces duty were flight surgeons. However, with the tremendous expansion of aviation during the past six years such assignment was not possible. Nevertheless, over 5,000 doctors, thoroughly indoctrinated in Aviation Medicine, were added to the Armed Forces during this period. It is the hope, in the Army Air Forces certainly, that with the cessation of hostilities, all doctors assigned to duty with flying personnel will again be thoroughly versed in the problems of aviation by having attended the service schools and having received the required designation of flight surgeon.

In the Services the application of Aviation Medicine brings it into contact with the cadet applicant immediately upon his presenting himself for the purpose of pursuing flying training. From that time on, throughout his flying life, he is never outside its beneficent scope. During his training period he is continually under observation as to his physical well-being and, more especially, as to how he is adapting himself psychologically to the flood of new sensations and situations that he is experiencing in an effort to help him over these early hurdles of his flying life.

After the cadet has earned his wings and passes on to his transitional training period, a period fraught with many dangers, since at this stage he may think himself invincible in a plane, he may do something foolish that may lead to disaster. Having weathered this period the young man is then detailed to an operational unit. Here he becomes a part of an air crew and, depending on his assignment, he may be sent into any part of the world. The flight surgeon is always at his side ready with advice, counsel, and indoctrination to make the air crewman's life more livable in several senses of that term.

If assigned in the Arctic his flight surgeon will give him instructions, to refresh his memory, relevant to the medical aspects of flying generally but specifically how to use protective clothing, warning him at the same time against such hazards as excessive perspiration in sub-zero weather. He is taught how to survive should he be forced down on snow or ice; how to use his emergency communications set, and how to use his parachute silk for protection and the building of temporary shelter. Instructions in the use of such other emergency equipment—fire making, fishing, snaring, hunting, etc.—are given and all emergency equipment furnished. The deleterious effects of glare from the snow, ice, and sea are brought to his attention, and goggles of an appropriate color are supplied. One of the flight surgeon's most difficult indoctrinations of flying personnel in these regions is the combating of lonesomeness, especially during the long winter night when monotony and boredom grip the entire command.

If the airman is assigned to duty in the tropics protection against the sun is stressed, again with reference to clothing and general bodily protection. The necessity of protection against tropical diseases, insect bites, and the use of prophylactic drugs is continually dinned into his ears. The taking of these drugs is a medically supervised procedure and statistics of the last war have proved how effective this was.

Instructions were and are now given airmen on how to survive in the jungle. Here too emergency equipment is furnished those who might suffer such a devastating experience, this included, in addition to the usual survival equipment, mosquito bars, and a particular-

ized emergency ration. Instructions are also given in the recognition and protection against venomous reptiles, the effect of enervating heat, and conservation of strength, the necessity of using salt and, as always, the psychological effect of such an experience.

Ditching procedures for various types of aircraft, as each has peculiar characteristics in this emergency, were first worked out by our British allies. When it became necessary for our Air Forces to know something about such techniques the same were worked out under the supervision of The Air Surgeon of our forces. When our airmen "ditched" it became necessary to rescue them, and this brought with it "air-sea rescue." Such air-sea rescue was drilled into flying personnel, not only those who might have to be rescued but to rescuing crews as well. The daring rescues, at times from under the very eyes of the enemy, make one of the most thrilling and hair raising records of the late war.

Instructions in first aid to the injured is of paramount importance, for where is such knowledge more needed than in a bomber engaged in aerial combat, with a crew of from two to ten, some of whom may be seriously wounded or unconscious from anoxia, many miles and hours from its home base.

During active operations the real flight surgeon saw his men prior to the "take off," giving each one a last critical survey to see that each man was fit for the hazardous mission he was about to begin. Upon the return of the flight this same flight surgeon, after having "sweated out" the intervening period, was ready and waiting on the landing strip to care for those who were in need of his professional ministrations and to give a welcome to those who had returned unharmed.

Many a heart-warming tale is told with pride by returned air veterans of how their "Doc" was always on hand and how they had learned to look for his cheery, confident face immediately upon landing.

The flight surgeon, who is a flight surgeon in fact, is one of the greatest morale builders in any Air Forces outfit. He is continually consulted by the Commanding Officer and has direct entree to his office. I am informed that this same procedure is in vogue among the larger airlines, where the senior aviation physician has a direct approach to the president of the company. It must be so, for how could the medical officer or the senior physician discuss with any one but the "tops" the oft intimate problems brought to him by the flying personnel of his group!

Aside from those factors that are primarily due to war and the assignment to strange parts of the globe by reason of such war, the flight surgeon has many other things concerning which he must indoctrinate his air crew members. The matters concerning which I shall now speak are those factors that are inherent in flying itself and that have their effect upon all personnel who participate in powered aerial flight. It is in connection with these conditions that the flight surgeon's knowledge of technological matters is called upon, and he must work in close harmony with aeronautical engineers and others of the engineering profession for the solution of the many problems yet unanswered.

Some airplanes, even of the present, have been developed by aeronautical designers and engineers to such an extent that the human economy, not being adaptable to similar developmental changes, has lagged behind. The limitation of the human body with its finite characteristics must be brought to the attention of the designers and engineers so that adaptive measures for their proper human manipulation may be developed. Whose responsibility should this be but that of the medical man versed in the physiological and psychological problems of aviation?

The effect of decreased atmospheric pressure as one rises to altitude affects all living organisms. Altitudes may be reached in which this factor alone may cause death. The engineer in designing an airplane is interested abstractly in developing a machine that will attain a certain altitude. The flight surgeon, however, visualizes the individual who will be called upon to handle the controls and be a functioning organism when the engineer's maximum altitude is reached. His advice to the engineer is pressurization which on consultation is determined upon. The next question that then arises is "How much of a shock can the human economy tolerate in the case of explosive decompression?" Here again the answer is forthcoming from the flight surgeon by reason of the physiologic experimentation done in the laboratory. This question has assumed great practical importance in commercial aviation as airlines are now projecting transcontinental flights at an altitude of 40,000 ft., where the atmospheric pressure is reduced to 2.72 lbs. per sq. in. Flight surgeons have been asked to express an opinion as to how much pressurization should be used. The optimum, of course, would be sea level pressures of 14.6 lbs. per sq. in., but these the engineers believe too sanguine, from the standpoint of engineering. Some compromise is being arrived at, so that all passengers may fly at a pressurized altitude that is compatible with good engineering practices, safety, and comfort.

Another and more pronounced altitude effect is the diminution in the partial pressure of oxygen. But few are able to maintain normal functioning, by reason of anoxia, above 18,000 feet, and none can function without supplemental oxygen at the height of Mt. Everest. "Bends" and "Chokes," the symptoms of anoxia, have been known by the flight surgeon for years. It was through his efforts, again in consultation with engineers, that a suitable oxygen mask was developed. During the past war when at extreme operational altitudes the oxygen mask froze, it was the experimental work done by flight surgeons, working first in the theater, that brought about an improvement in this apparatus with a most gratifying decrease in the number of disabilities due to anoxia as a result of frozen masks.

The type of clothing worn by aviators to protect them from the extreme cold, another of the disabling factors encountered at altitudes, had its modest beginnings in the research made by a flight surgeon working obscurely in the wilds of Alaska. This has now progressed to the point of electrically heated clothing, as well as other types, so that comfort and protection may be had under any of the vagaries of climate encountered.

The illusions of the senses as related to the internal ear that caused so many deaths by crashing in the fatal "spin," were elucidated by a flight surgeon in 1928. His clear exposition and interpretation of the illusions were the basis for the development of instruments that have made instrument flight possible and without which no long distant flight could possibly be made.

The success in the transportation of sick and wounded during the last war is a great tribute to the flight surgeons, who for more than 25 years have urged this mode of transportation of patients as being practicable, feasible, humanitarian, and life saving.

So it is that whether one be speaking of the subjects already discussed or the effects of vibration from the newly developed jet plane, or noise, or speed, or noxious gases, one finds the flight surgeon deeply engrossed in study in his laboratories to assist the engineers in the elucidation of the problems as they affect not only the flyer, but everyone whom they might harm.

It is worthy to note that modern application of an ancient protective device

—the body armor—was the development of a flight surgeon, who, working almost alone and against great odds, was able to have aircrews volunteer to wear his device. It was but a short time following the survival of one, who surely would have been killed, that the "flack suit" was demanded by many. The numbers of those wearing this garment, who have been saved from certain death, is legion.

With the tremendous increase in the speed of airplanes the question of the safety of the pilot, in a pursuit plane particularly, should anything occur to render it unmanageable, immediately presents itself. It is at once apparent that the human body cannot tolerate air pressures developed at speeds such as are possible even today. Some means of getting the pilot out of the plane had to be developed. Ejection, therefore, had to be considered. This is not a new principle. Ejection seats were developed by the German Air Force and are being improved by us, through consultations and experimentation between our engineers and flight surgeons. It will be necessary to eject the pilot, in a capsule, which when slowing down will enable the pilot automatically to rid himself of the capsule and permit the use of his parachute.

Again in the matter of speed what will happen to the human economy when supersonic speeds are reached? The engineer is unable at this time to predicate what will happen to the structure of the airplane and we are at a loss to know, as yet, what will happen to the individual flying this plane. Can it be possible that the airplane, as now constructed, with its human cargo, will, as one engineer expressed it to me "hit a solid wall"? The supersonic "wall" has not yet been broken through and that which lies just before it and just beyond it is an unknown quantity of the utmost magnitude and will tax the acumen of all who work on this baffling problem.

Researches are now being made by aviation medical experts into the effects of cosmic rays on flying personnel because of the heretofore unbelievable altitudes to which airplanes will ascend within the immediately foreseeable future.

One of the greatest differences between Aviation Medicine and that which is known as occupational medicine or industrial hygiene lies in the stressing in Aviation Medicine of the psychological reactions of those who come under its authority. Aviation Medicine considers the individual not only as a single functioning organism in a profession, but as a total integrated personality. The stresses and strains of military and airline flying, to say nothing of the hazards of battle flying, as practised and envisioned in the future, are such as to produce personality difficulties in those less well integrated than are their fellows. The flight surgeon must be ever on the alert to catch those subtle changes and recommend remedial measures. This phase of his work in my opinion is one of the most important, of his duties.

Much has been written here concerning a relatively new system of medicine having its world-wide application to the problems of aviation. The question naturally arises as to how successful is such a system of medicine in accomplishing that which it has set for itself. The answer is immediately at hand, as it has been reported to me by a reliable informant that Messerschmitt, the famous German airplane designer, after his capture, made the statement to my informant that the American aircrewman knew more concerning aviation medical matters and was better indoctrinated in how to care for himself than were even the German physicians assigned to aviation duty.

The situation, in connection with Aviation Medicine, in an organized body as the Air Forces, is ideal for the de-

velopment of a system of medicine such as has been outlined. There are those who will state that such practices as outlined cannot be carried out in civil pursuits, and yet it is working in civilian aviation. Certainly civil aviation does not have the control over its personnel that is exercised by the Services. Granted that the principles enunciated are not as fully applicable in all phases, nevertheless in civil aviation, as in the Air Forces, there is a parellelism in this respect that is splendid and augurs well for the future of the flying profession.

It must be remembered, too, that while the flight surgeon gave original impetus to aviation medicine, the effects of which have spread beyond the boundaries of the Services, many of the advances that have been described have been made through the agencies of civilian laboratories.

It has been my pleasure to enumerate to you some of the specific ways in which we who practise Aviation Medicine consider our work. There are many facets of this rapidly developing art that, because of the limitations of time, cannot be touched upon. Suffice it to say that there is no phase of a flyer's life or activity in which the flight surgeon does not have a deep and abiding interest and concern.

The answer to the question put to me "Is Aviation Medicine Industrial Hygiene?" may be answered in the affirmative with "Yes, it is industrial hygiene and more" since it goes further, and in my opinion, is broader in its concepts and certainly in its practices than is industrial hygiene.

There is much that industry at large may learn from the flight surgeon. Therefore, the principles and practices of Aviation Medicine, its ulterior motives being understood, may well be used as a pattern in the solution of the medical problems in industry.

Program Audit—A Device for Reflecting Public Health Performance*

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ALL persons concerned with public health administration must have become disturbed about the increasing volume and complexity of reports and records that characterize our routine operations. Paper work in public health has long since passed the stage of being a source of irritation; it now constitutes a significant drain on the time of professional and technical personnel and thus has become an appreciable item in health department budgets. Part of the need for records arises out of the numerous occasions the primary worker will have for examining change in a case or situation under observation or for influencing a course of action. In greater measure it would seem that the requirements for both records and reports are determined by persons in supervisory positions and by agencies that administer grants-in-aid either financial assistance or technical services, in lieu of money grants. Clear-cut administrative reasons for these latter requirements in particular are always difficult and often impossible to elicit, much less justify.

It is traditional among our citizens to blame their government for most of their grievances, either real or imaginary, and for one layer of government to pass the blame on to another. Because the authors happen to be situated at the federal end of the line, we could choose between only two courses—either reverse the process of fault finding, or accept the task of doing our part in trying to correct a situation which, we think, all agree is becoming truly serious. The latter course of action was chosen. Our methods and observations are presented with the conviction that they are timely and of general application in public health practice.

Those of you who occupy administrative positions in state health departments will recall that three years ago the authors began the collection of information on which to revise the requirements of the U. S. Public Health Service for the plan of organization and operation which a state submits annually in justification of federal funds for general public health purposes. On the basis of observations and in consultation with division directors in state health departments, a new type of plan was developed and has since been placed in general use, after clearance with the Committee on Business Management of the State and Territorial Health Officers. Although somewhat of a digression, a very brief description of the plan seems in order at this point, since it sets the stage for the audit procedure which completes the system of controls.

The plan submitted prior to the beginning of a fiscal year sets forth the funds that are available locally for support of the program, together with those that are contemplated from other sources. In so far as practicable, funds are assigned to specific functions. In

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

like manner, the staff is described by numbers in professional categories and according to functional assignment, wherever this is possible. There is also a statement of facilities operated by the department and the services associated with them. Each significant function of the department is then depicted by indicating—after a series of descriptive phrases—whether the activity is represented in the program and, if so, whether it is a major or minor item. By using an appropriate symbol, the reporting officer indicates whether there has been increase or decrease in the activity as compared with the previous year, and whether he plans to expand, contract, or maintain about the same level of operation in the ensuing year. After review and acceptance, this plan constitutes an agreement between the U. S. Public Health Service and the state health department concerned. Now the question is: how to determine later whether the grantee—in this case the state health department—has carried out the terms of the trust. In other words, what criteria shall be used in assaying performance or in measuring progress or retrogression?

It did not seem feasible to adapt the traditional quantitative expression of activities to our needs without falling back into the very fault we were trying to correct—the accumulation of voluminous statistical data. Substitution of professional judgment for a mass of uninterpreted figures appeared to be a more reliable means of determining what really makes a program "tick." We decided, therefore, to explore another technique in which we would apply to program operation the principle of "audit"—meaning, according to Webster "to examine and verify." The purpose of this exploration was to determine how the audit procedure might be adapted to a simplified set of requirements in public health administration. In this paper please keep in mind the words: "*A simplified set of requirements in public health administration*" because what we propose is not geared to epidemiology, administrative research, or any other requirement beyond that of enabling a grant-in-aid agency to determine whether the aided program has been pursued effectively in accordance with the approved plan. Neither records of population experiences nor those used for internal administration and self-evaluation of health department services are involved in this discussion.

According to the traditional philosophy underlying grants-in-aid in the field of public health, primary responsibility rests with the grantee—not the grantor—for the development of programs. This, of course, must be done within a framework of reference that is determined by the legislative act or trust under which the funds are made available. Beyond the original understanding, which an approval of plan signifies, the operator of a program should be free to work out his own procedures. Acceptance of a grant carries with it responsibility for achieving reasonable accomplishments and for observing the dictates of good administrative practices, including ordinary fiscal honesty. At the same time, those who represent sources of funds need to obtain general understanding of those programs, to determine whether they are operating according to covenants, and to appraise results in relation to expenditures. With these general principles there is common agreement, but their application has given rise to a very cumbersome system of records and reports for which we now propose a simpler system of program audits.

The audit device is not presented here as a perfected instrument for solving the administrative problem of relating actual performance to plans previously agreed upon. Since there is still much to be done in its development, you may regard this discussion as somewhat premature.

On the contrary, your consideration of the subject has purposely been invited at this stage so that there might be more general understanding of our objectives. Because health officers have a mutual interest in this problem, it is hoped they will contribute to our thinking and efforts in this direction before a fixed procedure has evolved.

The underlying principle of program audit is field observation of actual operations by persons of experience and judgment, and heart to heart—or at least, face to face—discussion between representatives of the supporting agency and of the operating agency. Through such observations and discussions more intimate knowledge concerning a program can be gained in a day or two than through weeks of study of summary activity reports. Program audit has the added advantage of combining consultation with appraisal under circumstances which can be made as informal as the occasion warrants.

For instance, traditional reports on clinic activities usually call for the total number of persons, by prescribed classifications, that have been served over a given period, together with counts of persons disposed of in several significant fashions. True, some idea of the general effectiveness of the program and of its accomplishments could be derived from such data, but much, if not all, of its value is lost in the routine tabulations that are generally made. The authors maintain that a personal visit to a random sample of these clinics would reveal a great deal more. Spot review of the operating case records taken directly from the clinic file would give all information contained on a periodic report especially prepared for submission to a supporting agency and requiring hours of time both in preparation and review. In addition, it would be possible to determine at first hand whether the case load of the clinic justifies its operation; whether it is accessibly located; whether the clinic hours are convenient for the patients to be served; how well the session is organized; whether it is conducted with due regard for the patients' feelings—causing them a minimum of discomfort and embarrassment; whether waiting, interviewing and treatment rooms are comfortable and well arranged; whether interviewing is skillfully done; whether equipment is sufficient and well cared for; whether there is an adequate staff of properly qualified personnel in attendance; and whether acceptable diagnostic and treatment procedures are used. In other words, by actual observation a competent surveyor can differentiate between good and poor performance in a way that it is not possible to express statistically.

Consequently, the thesis that intelligent consultants in the several fields of public health quickly develop reliable impressions of people, equipment, and character of service, that are more revealing than any quantitative enumeration of activity, is the primary base upon which the scheme of program audit is founded. On the other hand, a *completely* unguided series of observations, made by a number of different persons cannot be trusted entirely to elicit a comparable body of information.

While the expert apparently is able to form an opinion concerning a situation at a glance, an uninitiated person goes through a ponderous process of weighing every element of a program before reaching a conclusion. However, if you pin the expert down, you will find that—unknown to himself, perhaps—he, too, applies certain criteria in arriving at his conclusions. In short, for program audit, professional judgment of a program must be tied to a real system of observations and follow a defined method of approach. We have consulted with numerous specialists in the various health fields for the purpose of learning the particular points on which judgment

should be based, thus minimizing the chance of personal bias being mistaken for sound professional judgment.

Prior to visiting the state to begin work on the audit-proper, preliminary study is made of commitments in the plan, particularly those concerned with funds, staff, equipment, and service items that the respective programs comprise.

From this preliminary synopsis the program auditor—always a technically trained person and usually a specialist in the particular field under study—forms an idea of what he expects to find when he reaches the scene of operation with respect to the general appropriateness of resources and methods of operation and of how these elements fit together. These impressions will be confirmed, modified, or completely refuted by the situation he actually finds during his visits. Explanation regarding questionable situations suggested by this preliminary study, as well as verification of approved situations, will be obtained in the field.

When the program auditor visits the area he first determines whether there are any peculiar problems that materially affect the program under scrutiny, whether such problems are susceptible to solution, and if so, whether reasonable effort is being made to get them solved. With this knowledge to serve as a guide, he proceeds to make observations that will reveal how the program is actually operating, reasons for any weaknesses that he finds, and conditions contributing to outstanding accomplishments. Conclusions concerning the *quality* of services rendered are based on several approaches: Well formulated questions designed to reveal the knowledge, attitudes, and skills of the operating staff with respect to the various elements of the program; field visits with staff members for observation of the techniques in use and reaction of persons served; spot check of operating records to determine actual accomplishments in the most significant aspects of the program; examination of the educational materials used; and determination of methods employed by the operating agency for evaluation of the effectiveness of the program as a whole or of any particular component element. From his spot check of service records the auditor determines also the coverage of services rendered—in terms of geographic area and population reached and in terms of essential items included. He observes economy of operations; adequacy and arrangement of quarters, equipment, and supplies; general morale of the staff; progress toward accomplishing objectives; staff advancement; and improvement of program. As observations are made from time to time throughout the year the consultant makes notes of his findings for later reference. At the end of each visit he records on a report sheet designed for the purpose pertinent comments regarding each observation. On a predetermined date, reports of the several consultants—containing the brief, concise statements that have been entered cumulatively—are summarized into an overall audit report for the health department as a whole.

Although the types of observations are stated here in very general terms, we have systematized the procedure to be followed by preparing for the use of all program auditors an outline that is used as a guide in performing the audit. Usually casual questioning will lead to the selection of sample records or current situations for careful checking. Where counts are necessary, these can be made from regular operating records. *No documents beyond ordinary records for internal operation of the health department need be kept for supplying information necessary for grant-in-aid administration when a procedure similar to that described* is followed. Furthermore, some account is taken of person-

nel. It may be almost axiomatic that with the right kind of people on the job —people of competence and integrity, in reasonable numbers, having sufficiently varying professional backgrounds and adequate equipment with which to work—then a creditable performance can be assumed with a reasonable degree of confidence. However, to assure oneself on this point, he must begin by examining into the qualifications of the staff, but more especially into the personnel practices of the department under audit. In this way, he can determine whether the type of performance disclosed by the audit of service is likely to continue.

Throughout the auditing procedure, which should be integrated with regular consultation visits during the year rather than scheduled as a separate independent procedure, rapport is developed between the surveyor and the organization under review for, by this arrangement, the questioning which takes place is not a form of catechism but entirely a give-and-take discussion —a technique which engenders and fosters the spirit of coöperative endeavor.

At this point we are satisfied that program audit will more nearly meet our needs than any scheme we have yet tried, and there is strong basis for feeling that state health agencies in turn can use it for reducing some of their present reporting requirements of local health units. Any records that are being kept locally for the sole purpose of accumulating information to be reported to someone else—whether a state or federal agency—should be scrutinized with a view to being eliminated. In all probability, if state personnel periodically audited programs according to the method which we have roughly outlined, they too, would be much better informed regarding those programs than when they rely upon reported statistics. Local health officers, as well, might advantageously utilize a similar technique in checking the performance of the various members of their operating staffs.

By way of summary, may we repeat just two points which we hope have been made perfectly clear: First, program audit is not an instrument for research. From the plan, which must be approved before any funds are authorized, it must be decided whether the program is fairly well conceived. A program audit is designed merely to show whether the plan is being carried out faithfully and with a *reasonable degree of effectiveness*. On the basis of facts revealed by a program audit we believe that it is possible to judge accurately enough whether a program is static, going backward, or forward. Research is another matter, and usually has a set of requirements all its own. While it is recognized that important information of research value may be obtained from routine administrative records, generally speaking, research should be set up as a special project, circumscribed in scope and—for the most part—allowed to continue during only a limited period of time. No system of everyday operations should be loaded down with requirements keyed to research purposes.

Second, true knowledge of an operating program cannot be gained by a person at a distance in his own office. Statements in defense of any system of records and reports that indicate it can be done are apt to be misleading; furthermore, such practice is detrimental to good relationship between supporting and operating agencies. Perhaps the chief advantage of program audit is the fact that it provides an opportunity for representatives of these two positions to meet each other face to face at the scene of action.

In conclusion, let us look to the future. Although programs of health departments are still of limited scope, there has already evolved an extremely

complex scheme of records and reports. Not only does it consume the full time of a clerical force nearly one-fifth as large as the total complement of health workers, but also, in some instances, it demands as much as one-third of the effective working time of professional groups. This situation becomes truly alarming as we envisage the future, which promises to bring in a multiplicity of new programs containing an infinite variety of personal services. As these "coming events cast their shadows before them" it becomes imperative that some sort of simplified administrative procedure be substituted for detailed reports. To meet this need, we offer you program audit.

The Evaluation of Local Health Work*

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THE development of local health services so far and that proceeding under the stimulus of the Subcommittee on Local Health Units makes evaluation an urgent requirement. We need to know how well we have done the job so far. We must know that new units are being soundly developed. We must know that the scarce personnel now available are performing activities which are actually effective and efficient. This is the major responsibility of local health officers, directors of the division of local health services, and of state health officers.

Evaluation is a very broad field. It means stock-taking of resources, personnel, and efforts. It requires an analysis of problems and how well they are being met with the machinery available. Also, it must ask, as Dr. Allen Freeman frequently does, "How much does it cost?" It includes the knowledge of all the community efforts in the public health field and critical study of how well they are integrated or correlated. It is essential to intelligent program planning. It is the one excuse for reports and most records as discussed by Dr. Mountin and Miss Flook.†

Although there are many devices and methods of evaluation, there seem to be three principal types. The first is the study of some type of activity report, which should be a current and constant process; the second is by the use of some type of check list, such as the *Evaluation Schedule* of the American Public Health Association, which should be used at fairly regular intervals; and the third is the formal survey which should only be used to meet special and well defined objectives. Each is dependent on the preceding method, as well as other sources, for basic data. Each is a valuable tool of the local health officer, director of local health service, and the state health officer when judiciously used.

It is commonplace to talk about using activity reports, yet I presume we all have been guilty of sending in the old Quarterly Activity Report without looking at it. The lack of critical attention has occurred at each of the way stations noted, namely, the local unit, the state local health service, and the state department, *per se*. Not too long ago I recall a well trained state records official spending several days correcting quarterly reports which were then transmitted up the line and carefully filed. I believe every local health officer at least deserves a letter about his report from his director of local health service. It requires only a few minutes to see if the local unit has been able to protect any babies that month, or if the expectant mothers are making more than one visit to the prenatal clinics, or whether the sanitarian got around to his water samples, or visited any rural schools. Likewise, it is of great significance for the local staff to pause long enough to see what their collective efforts have been able to accomplish—

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

† See page 1137, this issue.

was it 10 or 100 infants protected, or were 2 or 30 per cent of the restaurants visited?

Let us go back for a moment a step farther to the daily work sheets from which the activity report is usually tabulated. It pays a local health officer occasionally to find out who is doing what on his staff. His supervisors should be doing this, of course, in larger units, but sometimes it is a long while between definitive analyses. Since public health staff persons are subject to human frailties, an occasional carefully administered jogging or pat on the back is helpful and probably necessary. More fundamental, of course, is the analysis of these records side by side with the local problems. Significant advances are being made in facilitating this kind of evaluation by the use of punch cards in local health departments.

The use of a check-list or more elaborate inquiry form is also necessary periodically. The development of such an instrument is not simple. After nearly 20 years of growth the current *Evaluation Schedule* is recommended for use by the Committee on Administrative Practice. I admit to a prejudice in its favor but I believe the prejudice is based on having seen it effectively used on many occasions and by as many different methods. The *Schedule* has real limitations. It is not easy to prepare. The *Schedule, per se,* is not the important focal point, however, as we all know. It is the *evaluation process* that is useful to the health officer. The *Schedule* is designed to help evaluate the community-wide program. It would be possible, and at times possibly desirable, to develop such a device to apply only to the health department. This would facilitate the preparation of a single form which could be prepared by the local health officer, with copies to his state office, the U. S. Public Health Service, Children's Bureau, A.P.H.A., or anyone else. It seems necessary, however, to look at the entire community if good program planning and maximum effective action is to be possible.

We cannot discuss all the details of the use of the *Schedule* here, but a few principles can be outlined. The most important, I am sure, is participation by every member of the staff of the health unit, by each agency involved. Personally, I like to take the *Schedule* apart and give appropriate sections to the staff and to other agencies such as schools, tuberculosis associations, etc. For example, it has happened that this is the first time that an engineer or sanitarian has been asked not how many inspections but what is the status of the food control program. This is the fundamental extension from the activity report to the *Evaluation Schedule*—or the program audit which Dr. Mountin described. The participation of public health people in this type of searching for facts is the backbone of good public health work. Parenthetically I might say that the health officer's special part of the *Evaluation Schedule* is the section on the problem analysis and it does not help anybody appreciably for the *clerk* to complete it. The *Schedule* is, however, designed to measure the community program and the community must help prepare it and study it after grading if really effective use is to be made of it.

A second important principle in the *Schedule* is the dominant item idea. It is invaluable in orienting the health officer, the staff, the agency, and the community in the essential relative values in public health. You will recall that it is believed by the Committee on Administrative Practice that there are certain aspects of any health program so essential that if they are not being carried out adequately, the total program must be considered poor. For example, in milk control, one might have a very fine group of dairies with the usual controls but, unless most of

the milk is pasteurized, we could hardly consider the milk control program good. Or, in tuberculosis control we could scarcely feel that we had an effective program if most of the active cases were still at home.

A third basic principle is that the standards by which the *Schedule* is graded are based on actual *practice*. Roughly speaking the standards for poor is the lower quartile of *Health Practice Indices*. In other words, if an activity is not being performed better than the lowest 25 per cent of practice it is considered to be poor. Or if it ranks among the top 25 per cent it is considered good. Obviously the validity of these standards will increase as *Health Practice Indices* includes wider representation from all over the country. Practice as determined by preparing the *Schedule* can be compared to that in *Health Practice Indices* or a standard of practice within the state can easily be established if schedules are available from a significant number of areas.

The division of local health service, in order to provide leadership, to be of maximum assistance and to be assured that maximum public health protection is being afforded with the resources available, needs to have current reliable evaluation data on each local health unit. The *Schedule* seems to be the best device at present to secure this and, therefore, it seems reasonable to think that a copy of a completed *Schedule* should be in use in the Division of Local Health Service for each well established health unit in the state. It will be found to have a great variety of office uses and to make field work much more effective.

There are, of course, a great many instances in which more detailed evalution is necessary than is suggested by either of the methods discussed so far. Either the activity reports or the *Schedule* will frequently suggest to the inquiring health officer items on which more information is necessary. For example, if it is learned that 15 per cent of the expectant mothers are receiving public health nursing service it will be important to learn if they are the ones needing the service most. In addition to this type, however, there are 2 areas which are quite important but less often investigated. One is the cost. Cost studies in public health are not new.[1, 2] Some groups of students of government are, however, critical of public health staffs for lack of cost data. These are not easy to determine but are certainly pertinent. Those items for which unit costs can be fairly accurately ascertained, such as laboratory tests or certain routine type visits, should be investigated. Unit costs of some bedside nursing visits can be determined. Costs have been studied at the rapid treatment centers showing a very wide range, and probably these often did not include all costs. We can learn from the techniques of hospital administrators. While cost studies are difficult, we cannot afford to neglect them and must continue to explore the problem.

Another important technique not adequately explored in public health is that of flow studies with regard to the use of referral agencies by the health department, and *vice versa*. A health department which rarely refers a case to another agency or to only one other, can hardly be said to be an effective social agency. The matter of the referral or use of consultation service within the health department itself can also well be studied. Health problems demanding a wide variety of skills and teamwork for their solution are the rule rather than the exception.

The final broad type of evaluation is the formal survey, usually done by a survey group outside the jurisdiction itself, in contrast to those discussed so far which are very definitely to be done by the local health unit. This fact that

the local unit does not prepare a survey constitutes a major weakness. Self evaluation is surely the most effective method. Occasions arise, however, which make the survey method useful, as for instance when a major reorganization seems indicated, or extensive inter-agency relationships are involved, or when there is serious disagreement as to overall public health problems. Such surveys are, of course, most commonly made by outstanding public health authorities, or a professional organization. The reports invariably require wide community support and understanding for their implementation. There is another type developing, however, which is of possibly greater significance to us here. Some state health departments with numerous well developed local units have found a need to use the survey technique. It is done by a team specially recruited from the state department staff, or by a field unit of local health service. It is, of course, merely an extension of the use of the field unit as described by Dr. Harry E. Handley in 1938.[3] The survey team will usually use the *Evaluation Schedule* as a nucleus and extend its researches into time studies of the staff, costs, flow studies, and appraisal of inter-agency relationships, etc. The technique can probably be of real value in the *development* of full-time local health service in areas now served by intrenched part-time service. It might be an equitable method of settling major disputes of personnel and subsidy. It should constitute an important resource in evaluating policies of state and local departments.

Evaluation of local health work then is an essential part and should be specifically incorporated in all health program planning. Its effective use is good preventive medicine against complacency and self-satisfaction. It should be carried on continuously by the use of activity reports and critical indices; at regular intervals by some such device as the *Evaluation Schedule;* and occasionally for definite, major objectives by the survey method. It is a responsibility of the local health officer, the director of local health services and the state health officer.

REFERENCES

1. Walker, W. Frank, Williams, W. Carter, and Underwood, Felix J. The Costs of Rural Public Health Services. *A.J.P.H.*, 32, 7:681 (July), 1942.

2. Ridley, Clarence E., and Nolting, Orin F. *How Cities Can Cut Costs.* The Inter-National City Managers' Association. 1933.

3. Handley, Harry E., M.D. *The Field Unit in Local Public Health Service.* New York: The Commonwealth Fund. 1938.

Penicillin in the Treatment of Infectious Bovine Mastitis*

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MANY laymen and veterinarians misunderstand the use of the udder infusions in the treatment and control of bovine mastitis since they assume incorrectly that all cows with udder trouble should be treated with these materials. Udder infusions are effective only against infection and are of *no value* where the cause is non-infectious in nature. In fact, the use of udder infusion in such cases may aggravate the trouble.

Cows that produce market milk must be healthy (especially free from udder infection), clean, and stabled in sanitary quarters if the milk produced is to be safe and of reasonable high quality. The presence of infectious mastitis in the lactating cows, and the lack of application of proper and adequate sanitary procedures in handling the milk, result in bacterial contamination of the milk. Everyone concerned (veterinarian, dairy farmer, milk sanitarian, and milk plant operator) must know something about the cause and the types of mastitis if the essential proper herd management procedures are to be applied in solving the mastitis problem of the individual herd.

WHAT IS MASTITIS?

Mastitis is a very general term that refers to any inflammation of the udder; such as the physiological swelling or congestion at "freshening" or that resulting from udder or teat injuries, or it can be the pathological change in the udder tissue as the result of infection. In so far as the condition of the cow and/or her udder is concerned, the mastitis may be classified as acute or chronic.

ACUTE AND CHRONIC MASTITIS

Acute mastitis may be divided into acute local mastitis and acute systemic mastitis. In the acute local mastitis, the symptoms of swelling, pain, and the production of milk of abnormal physical appearance are confined to the udder. The cow is eating well, and has a good appearance except for the udder changes. The acute systemic mastitis is characterized by a visibly sick cow in addition to the symptoms in the udder. The acute local mastitis may progress in severity to develop into the destructive and ofttimes highly fatal acute systemic mastitis.

Chronic mastitis is usually characterized by the absence of any painful swelling of the udder and by the production of a decreased amount of milk of normal physical appearance. Therefore, a cow may be infected for periods varying from a few weeks to several years before having an acute attack, and before the owner may become aware of the presence of the disease. The chronic mastitis may "flare-up" and become either acute local or acute systemic in nature. If death of the cow does not occur and treatment is in-

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, on November 14, 1946.

stituted, the acute condition may abate and chronic mastitis persist. This change from chronic to acute mastitis and *vice versa* may occur irrespective of the cause of the disease.

NON-INFECTIOUS AND INFECTIOUS MASTITIS

Udder troubles may be classified as non-infectious and infectious mastitis from the standpoint of cause. Such non-infectious factors as chilling, bruising, and injury of the udder or teats, rough handling of the udder during hand or machine milking, and the adverse effects, in some cows, of irregular or incomplete milking may cause mastitis of an acute or chronic nature depending upon the severity of the non-infectious agent or condition. Further, the damaging effects of non-infectious mastitis may predispose the udder to infection by bacteria.

The streptococcus group of bacteria most commonly causes the udder infection of a chronic type, but at times the streptococci and usually infection by *Staphylococcus aureus, Corynebacterium pyogenes,* and/or *Escherischia coli* and other bacteria produce an acute mastitis.

THE PREVENTION, CONTROL AND TREATMENT OF MASTITIS

The available scientific data, substantiated by field trials, indicate that the successful program for the prevention and control of bovine mastitis must include the following items in the order presented. Any effort to change this order is doomed to failure.

A. Good, sanitary milking procedures:
   1. Arrange and/or milk cows in following order: healthy, suspicious, and infected.
   2. Discard the foremilk into a strip cup, exclude from supply all abnormal milk.
   3. Wipe the udder of each cow with warm (120° F.) disinfectant one minute before milking.
   4. Exclude infected humans from milking cows.
   5. Dip teat cups of milker in disinfectant between cows (have milk tube valve in head of machine open).
   6. The hands of person milking or stripping should be dipped in disinfectant between cows.
   7. Milk each cow regularly, rapidly, and completely for udder health; employ a system of managed milking.

B. Good, sanitary herd management procedures:
   1. Proper stalls for cows.
   2. Prompt treatment of udder and teat injuries.
   3. Clean and disinfect stalls upon removal of infected cows.
   4. Keep barn and barnyard clean and dry.
   5. Raise heifers as disease-free replacements.
   6. Early removal of accessory teats.
   7. Preferred source of herd replacements; a—home raised heifers, b—purchase of bred heifers, c—purchase of milking cows—test before purchase.

C. Early and accurate diagnosis:
   1. Physical examination of each cow's udder.
   2. Bacteriological test to determine if infection is present or absent.

The physical examination of the udder and milk is valuable in determining the clinical condition of the cow and her udder. This information is important when a final decision must be made concerning the disposition and treatment of the individual case of mastitis. However, bacteriological procedures must be applied to properly collected milk samples to make the specific diagnosis of infection—if the infectious bacteria are present—or to exclude infection and, therefore, suggest that the cause of the trouble is non-infectious in nature. In my opinion, the veterinarian and dairyman must know the cause of the mastitis before they can intelligently apply preventive procedures or specific curative udder infusion treatments.

D. Elimination by slaughter or complete segregation of infected cows with badly damaged udders.

1. Such cows usually do not respond to udder infusion treatments.
2. This eliminates or confines the source of infection.

E. Early and proper treatment.

1. A high percentage of cows, without marked change in the udder, recover by udder infusions.
2. Udder infusions are of value only where infection is the cause of the mastitis.
3. Control measures must accompany treatment or the recovered case may become reinfected.

The judicious use of the udder infusions in treating infectious mastitis must necessarily be accompanied by sanitary milking procedures and farm sanitation if the occurrence of infection is to be prevented; otherwise, the recovered case becomes reëxposed and reinfection may occur.

PENICILLIN LEVELS OF MILK FOLLOWING UDDER INFUSIONS

The concentration of penicillin required in the infected area depends on the susceptibility of the infecting organism. The strains of hemolytic staphylococcus of bovine (mastitis) origin, and the group B streptococcus (*Streptococcus agalactiae*) are practically all inhibited by 0.025 units of penicillin per ml. Thus a concentration of 1 unit per ml. of milk should give a safe margin for these organisms.

In 1945 Murnane[4] reported relative to the units of penicillin in milk at different time periods following the infusion of 15,000 units per quarter into cows in varying stages of lactation. These data, presented in Table 1, indicate the effective level maintained for a relatively long period of time.

EFFICACY OF PENICILLIN IN THE TREATMENT OF INFECTIOUS MASTITIS

When streptococcus and staphylococcus infected animals, without marked physical changes in the udder, are treated with either an aqueous or oil solution, the various investigators have reported recoveries (become free from udder infection) in approximately 50 to 90 per cent of the cases. More recently, mastics—a new penicillin medication form—have been used by us to treat a series of 82 cows with chronic streptococcic mastitis which upon physical examination were deemed suitable subjects for treatment. Seventy-six or 92.6 per cent of the treated cows became free from the udder infection while 6 or 7.4 per cent remained infected despite repeated treatment. These data indicate the value of penicillin in the treatment of infectious mastitis caused by organisms that are susceptible to penicillin; in addition, they show that not all cows considered as good subjects for treatment will respond to the penicillin therapy.

PENICILLIN IN HERD TREATMENT OF INFECTIOUS MASTITIS

The necessity for good management procedures in the herd undergoing

TABLE 1

Penicillin Levels in the Milk at 4 Hour Intervals After Administration to Cows in Various Stages of Lactation

		Penicillin Concentration		
State of Lactation	*Administered 100 ml. of Solution*	*After 4 Hrs.*	*After 8 Hrs.*	*After 12 Hrs.*
Early (in full milk)	150 u. in 1 ml.	40 u. in 1 ml.	4 u. in 1 ml.	0.6 u. in 1 ml.
Middle (moderate milk flow)	"	42 "	16 "	4 "
Late (drying off)	"	81 "	33 "	21 "
Dry	"	81 "	66 "	40 "

TABLE 2

The Results of Penicillin Treatment in Herds Under Good, and Herds Under Poor Management

Herd	Total Cows	Infected Cows: Total	Infected Cows: Slaughtered	Infected Cows: Treated	Treated with 25,000 Units of Penicillin /Quarter in 50 ml. of Sterile Water	Results in Months After Treatment: ½	1	2	3	4	5
Herd Under Good Management Procedures											
1	15	2	0	2	3 times at 24 hr. intervals	2—	2—	2—	2—	2—	2—
2	18	8	1	7	" "	7—	7—	7—	7—	6—, 1+*	7—
3	21	5	0	5	" "	5—	5—	5—	5—	5—	5—
Herd Under Poor Management Procedures											
4	10	8	2	6	3 times at 24 hr. intervals	5—, 1+	5—, 1+	3—, 3+*	4—, 2+*	5—, 1+	3—, 3+
5	17	12	4	8	" "	7—, 1+	6—, 2+	3—, 5+*	6—, 2+	6—, 2+	2—, 6+
6	20	10	3	7	" "	7—	6—, 1+	6—, 1+	5—, 2+*	6—, 1+*	3—, 4+

* Again treated as before.

penicillin udder infusion treatment is presented by the data of Table 2. In only one case, herd 2, did a treated and recovered case become reëxposed and reinfected, whereas reinfection was the rule in the herds under poor herd management practices. The treated and recovered case must be protected from reëxposure by good, sanitary milking and herd management procedures since the successful treatment does not impart any immunity to the animal. If this is done the udder infusion treatments, such as penicillin, can be a real aid to mastitis control.

SUMMARY

The successful prevention, control, and treatment of mastitis includes, in the following order:

1. Good sanitary milking procedures.
2. Good herd management procedures.
3. Early and proper diagnosis.
4. The elimination from the herd of infected cows with badly damaged udders.
5. Early and proper treatment, penicillin is effective in a large number, but not all, of the cases of infectious mastitis caused by organism susceptible to penicillin.

REFERENCES

1. Baker, C. A. V. Observations on the Use of Penicillin in the Treatment of Bovine Mastitis *Canad. J. Comp. Med. & Vet. Med.*, 9(9):235–243, 1945.

2. Bryan, C. S., Horwood, R. E., and Huffman, C. F. A Preliminary Report on Penicillin in the Treatment of Chronic Streptococcic Mastitis. *Vet. Med.*, 40(3):87–89, 1945.

3. Kakavas, J. C. Penicillin in the Treatment of Bovine Mastitis. *North Am. Vet.*, 25(7):408–412, 1944.

4. Murnane, D. A Preliminary Report on the Treatment of Clinical and Sub-clinical Streptococcus and Staphylococcus Infections of the Bovine Udder with Penicillin. *Australian Vet. J.*, 21(4):82–90, 1945.

5. Murphy, J. M., and Pfau, K. O. The Value of Local Injections of Penicillin Sodium in the Treatment of *Streptococcus agalactiae* Infection and Mastitis in Cows. *Cornell Vet.*, 35(2):87–102, 1945.

6. Slanetz, L. W., and Allen, F. E. Treatment of Bovine Mastitis with Penicillin. *J. Am. Vet. M. A.*, 107(820):18–20, 1945.

7. Schalm, O. W. Recommendations for the Use of Penicillin in the Treatment of Bovine Mastitis. *Univ. of California* Mimeograph., 3 pp., 1945.

8. Schofield, Frank W. Penicillin in the Treatment of Mastitis. *Canad. J. Comp. Med. & Vet. Med.*, 10(3):63–70, 1946.

9. Walker, John W. Penicillin in Peanut Oil with 3 per cent Beeswax: Local Use in Staphylococcal Mastitis. *J. Am. Vet. M. A.*, 108(831):413–421, 1946.

Oral Environment and Fluorine*

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FLUORINE AND DENTAL CARIES: SOME SALIENT POINTS

THE history of fluorine† and dental caries begins with the discovery of fluorine in a fossilized elephant tooth by Morichini, as reported by Morozzo[43] in 1803. Nearly one hundred years later Eager[23] observed black teeth among natives of Pozzuoli, Italy. This condition was described by Black and McKay[11] in children of Colorado Springs and called "mottled enamel." Fluorine in the drinking water at the time of formation of the enamel was shown to be the cause of mottled enamel in 1931 by Churchill (reported by Theriault[49]) and by Smith, Lantz, and Smith.[47]

Armstrong and Brekhus[4] found the fluorine content of the enamel of 46 sound human teeth to average 111 p.p.m.; that of 39 carious teeth averaged 69 p.p.m. The difference of the means was 11.9 times its standard error. They also found[3] that the fluorine content of mottled enamel ranged from 250 to 361 p.p.m., and that severe caries existed in some of these mottled enamel teeth. Caries, or at least a condition thus far not distinguished from caries, is frequently observed in teeth with mottled enamel.[36]

Miller[37] markedly inhibited dental caries in the albino rat by feeding 250 p.p.m. of sodium fluoride in a caries producing diet. Cox, Matuschak, Dixon, Dodds, and Walker[19] reduced the incidence of caries in young rats by feeding their mothers rations containing from 10.3 to 41.2 p.p.m. of fluorine during pregnancy and lactation. The experiment of Miller[37] was one in *posteruptive* prevention of caries by a high level of fluoride feeding; that of Cox, et al.[19] prevention by the traces of fluoride transmitted to the young by the mother only during the *period of formation* of the enamel and *prior to eruption* of the teeth.

Dean, Jay, Arnold, McClure, and Elvove[22] observed a rate of 194 carious permanent teeth per 100 individuals in 243 children, 12 to 14 years of age, and of continuous residence in Galesburg, Ill., where the water supply had 1.8 p.p.m. of fluorine. They found a rate of 628 carious teeth in a comparable group of 291 children in Quincy, Ill., with 0.2 p.p.m. of fluorine in the water supply. It is of particular interest that they found a much greater reduction of the incidence of caries in the upper anterior teeth than in the molars. Dean and his coworkers extended their surveys with similar findings[21] in other cities with a total of 7,257 children studied. Their observations have been confirmed by others in widely scattered parts of the world.

Volker[50] found that powdered human enamel showed a significantly diminished solubility at pH 4.0 after it was shaken for one hour with sodium fluoride solutions as dilute as 100 p.p.m. His data give positive evidence that reduction of caries by fluorine is due to reduced solution of enamel by acids

* Presented before a Joint Session of the Food and Nutrition and Dental Health Sections of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

† "Fluorine" in dental caries literature never means elementary fluorine but the "fluoride ion" in solutions, or "combined fluorine" in solids such as salts or dental enamel.

produced by bacteria. Cox[18] and McClure[34] found (a) that the fluorine content of human saliva is of the order of only 0.1 p.p.m., and (b) that it is not significantly different in the salivas of children from areas with low fluoride waters and those with fluorine in the water up to 1.8 p.p.m.

Cheyne[14] made topical applications of 500 p.p.m. fluoride solutions at 3 month intervals to the deciduous teeth of children and reported an average of 3.09 new carious surfaces in a year as compared with 6.04 in a control group. Bibby[7] applied 1,000 p.p.m. sodium fluoride every 4 months to the permanent teeth of children. In a year, 60 new cavities appeared in control teeth and 33 in treated teeth.

ORAL ENVIRONMENT AND DENTAL CARIES

Predecessors of W. D. Miller suggested that microörganisms were factors in dental caries but he was the first to give an effective presentation of facts to support what is now known as the "oral environment" theory of dental caries. Miller, an American dentist studying in Berlin, in 1882[38] announced the two essential parts of his chemicoparasitic theory, namely, that the decalcification of the teeth in caries is due to acids formed *in situ* by microorganisms and that the acids are formed from carbohydrates. In a series of papers, which were later summarized in a book,[40] he described the bacilli associated with caries and produced caries-like areas in extracted teeth immersed for long periods in fermenting mixtures of bread and saliva. It is important to note that Miller considered that he had not found all the factors in tooth decay as he wrote[39]: "The extent to which any tooth suffers from the action of the acid depends upon its density and structure, but more particularly upon the perfection of the enamel and the protection of the neck of the tooth by healthy gums. What we might call the perfect tooth would resist indefinitely the same acid to which a tooth of opposite character would succumb in a few weeks." This *opinion* is generally ignored by the extreme oral environmentalist who asserts that any tooth will succumb to caries; it is the best hope of the nutritionist, whether he believes in pre- or posteruptive influences on enamel or both.

Since the time of Miller, bacteriologists have sought to identify organisms associated with caries. Some of the early workers who described *L. acidophilus* types were Goadby,[25] Moro,[42] Howe and Hatch,[29] Rodriguez,[45] and McIntosh, James, and Lazarus-Barlow.[35] Those who isolated streptococci from carious lesions and assigned to them a causal rôle were Sieberth,[46] Baumgartner,[6] Niedergesäss,[44] Hartzell and Henrici,[26] Sperling,[48] and Clarke.[15]

There has been considerable controversy over the relative contribution of lactobacilli and streptococci to the carious process. Bunting and Jay and their associates in a number of papers have shown the high correlation of counts of lactobacilli and *caries activity*. Jay[30] has said, "Many do not agree that causal relationship exists between the lactobacilli and dental caries. Regardless of this controversial point, these organisms afford an excellent means of estimating caries activity . . ." It is argued that streptococci are more active agents in caries since they are more frequently found in the advancing border of the carious process[26] and are more rapid acid formers.[9]

There have been attempts to immunize human subjects against dental caries by means of vaccines made from oral strains of *Lactobacillus acidophilus*. For example, Williams[52] has shown that following the use of such vaccines, blood agglutinin titers were increased but only 5 of 20 subjects showed a significant reduction in salivary counts for lactobacilli. No changes were found in the

dental conditions in respect to existing cavities or in new carious lesions. There are apparently antibacterial substances in human saliva "which destroy, inhibit growth, or so change the organisms that they lose pathogenicity" as shown by Hill[27] and by others. These substances may or may not be related to caries immunity.

Kendall[31] in 1910 introduced the term "aciduric" meaning "to endure acid" as being more appropriate than "acidophilic" when applied to organisms that can survive in media of high acid content. Gies and Kligler[24] considered the aciduric property to be one of the essentials of a caries producing organism, and Rodriguez[45] and McIntosh, James and Lazarus-Barlow[35] made survival at low pH the criterion by which to judge the relative caries producing power of an organism. By means of this hypothesis, streptococci, which relatively are weakly aciduric, were excluded from a causal rôle in spite of their continued existence in deep lesions where presumably low pH conditions should exterminate them. The aciduric hypothesis led to the adoption of media of low pH for study of bacteria associated with caries. Obviously this arbitrary procedure resulted in the suppression of streptococci and obscuration of their possible role in caries.

Bibby, Volker, and Van Kesteren[9] found that the amount of tooth substance dissolved by oral bacteria was proportional to the amount of acid formed. This relation of *acidogenic* rather than *aciduric* power to the production of dental cavities is the more logical. Bibby, et al. also showed that (a) streptococcal forms are more numerous in carious lesions, (b) streptococci form acid much more rapidly than lactobacilli, and (c) lactobacilli probably form no more than 0.025 per cent of the total acid arising from carbodydrates due to organisms found *in saliva*. They pointed out that neutralization of acid by dental tissues keeps the pH high enough for streptococci to survive.

Williams[51] observed dense masses of bacteria on teeth and considered such plaques as essential in the initiation of caries. Black[10] said, "The one thing necessary to the beginning of caries is the formation of such a gelatinous plaque in a secluded position where its acids may act . . ." Miller[41] did not accept plaques as essential to his theory and pointed out that plaques frequently occurred where caries is seldom found and that he had found incipient caries with no plaque cover. Blayney, Kesel, and Wach[12] observed caries with some plaques but not with others and associated the presence of lactobacilli in the plaques with the occurrence of caries.

INTERIM SUMMARY

The following points are summarized from the foregoing considerations of both fluorine and oral environment in dental caries:

Excessive fluorine during the period of formation of the enamel causes mottled enamel.

The condition of unmottled enamel, with respect to caries is related to fluorine in that sound enamel has a fluorine content of about 111 p.p.m. and enamel from decayed teeth about 69 p.p.m.

The fluorine content of mottled enamel ranges from 250 to 361 p.p.m.

Teeth with mottled enamel decay.

Sodium fluoride, given to young rats as 250 p.p.m. in the food *after* their teeth are erupted, markedly inhibits caries activity.

Fluorine, as transmitted to rats through the placenta and the mammary glands before eruption of the teeth, causes a significant reduction in the incidence of caries.

The rate of incidence of caries in children is significantly lower in areas with up to 1.8 p.p.m. fluorine in the drinking water than in regions with fluorine of the order of 0.2 p.p.m.

The reduction of caries in man by fluorine in the drinking water is greater in the upper anterior teeth than in the molars.

Exposure of powdered enamel to fluoride solutions reduces the rate of solution of the enamel at pH 4.0.

The fluorine content of human saliva is of the order of 0.1 p.p.m. and is unaffected by the

fluorine content of the community water supply up to 1.8 p.p.m.

Topical application to human teeth of fluoride solutions of the order of 500 p.p.m. and over, results in a significant reduction in new carious surfaces.

The production of cavities in teeth is said to be caused by acids formed by bacteria thriving predominantly on carbohydrates.

The count of *L. acidophilus* in saliva is an index of caries activity.

There is no convincing proof that any organism or group of organisms is specific in the production of carious lesions.

Successful immunization of human subjects against dental caries by means of vaccines has not been achieved.

There are antibacterial substances in saliva.

The cavity producing power of microorganisms is probably more related to their ability to produce acid than to survival in acid media.

IMPACT OF FLUORINE ON THE ORAL ENVIRONMENT THEORY

Fluorine was one of the factors in dental caries unknown to W. D. Miller.[40] However, the discoveries of the last ten years on the influence of fluorine on the course of dental caries in no way weakens the position of Miller, rather, it has made it more difficult to explain caries exclusively as independent of the tooth. Resistance to caries through nutrition is supported at least by the idea that caries-resistant teeth result[19] when an optimum amount of fluorine is available during the formation of dental enamel.

With the advent of fluorine as an anti-caries factor the theories of cause of tooth decay should have been thoroughly reëxamined and the action of fluorine studied from the many viewpoints. Unfortunately, because fluorides were known to be enzyme inhibitors and also retarders of bacterial development, the oral environmentalists early captured the field and bent fluorides to the purpose of proving rather than testing their theories. On the other hand, the toxicity of fluorides was against nutrition theorists and toxicity was emphasized by mottled enamel, a dystrophy displayed in the very tissue that a fluoride prophylactist would venture to protect.

In the case of both oral environment and nutrition theories, the quantitative phase of fluorine has been too little noticed. The fluorine content of waters that reduce the incidence of caries in children is of the order of 1 p.p.m.[21] Wright[53] found that a minimum concentration of 10 p.p.m. of fluorine affected acid formation from sucrose by a streptococcus. Bibby and Van Kesteren[8] concluded that fluorine concentrations of less than 1 p.p.m. "limit acid production by bacteria but concentrations in excess of 250 p.p.m. are needed to affect bacterial growth." It is to be noted that these are fluorine concentrations in continuous contact with the bacteria and not those of intermittent exposure as in the act of drinking of water. Consequently, it is not likely that the fluorine in drinking water up to 2 p.p.m. would retard acid formation by bacteria.

A generally accepted and an essential part of the oral environment theory of caries is that the acid which decalcifies teeth is derived from carbohydrate. Miller's[40] observations were made using bread as a source of carbohydrates. As it is simpler to prepare sugar media for culture of bacteria, it is possible that attention has been focused on the sugars as the "cause" of caries.

The albino rat is unique in that it does not develop dental caries after long consumption of diets containing glucose, sucrose, lactose, maltose, or corn starch at a level of two thirds of the ration.[33] Caries does not result in white rats in a year on a 53 per cent sucrose diet with lactobacilli forced into their mouths thrice weekly.[32] Yet if caries is initiated in the albino rat and fermentable carbohydrates are supplied, the cavities increase in size but not in number.[16, 28] These observations suggest that the process of *initiation* of caries may be different from that of *increasing* cavity

size. Such a hypothesis differentiating initiation from promotion of caries may be useful in clarifying the influence of fluorine in the prevention of caries since the influence of that element seems to be absolute prevention at a given site rather than a factor which slows the rate of cavity development. If this should prove to be true, then by means of fluorine, teeth can be formed that will not decay under the influence of bacteria and carbohydrate. Fluorine may also act to slow the rate of cavity development because it lowers the rate of solution of the enamel.[50]

It is unlikely that fluorine can be the salivary antibacterial substance of Hill[27] since it is only present to the extent of 0.1 p.p.m.[18, 34] It is also unlikely that the fluorine of saliva can diminish acid formation by bacteria as it is below the levels found by Wright[53] and Bibby and Van Kesteren[8] to affect acid formation. Also, a difference in fluorine content of the salivas would necessarily have to exist to invoke an acid-inhibiting theory that the reduction of caries incidence is related to the fluorine in saliva.

Dean, et al.[22] noted that the count of *L. acidophilus* in the salivas of Galesburg children—1.8 p.p.m. fluorine in the water—was lower than in the salivas of Quincy children with 0.2 p.p.m. fluorine. This diminished count according to Bibby and Van Kesteren[8] would require a concentration of 250 p.p.m. and could not therefore be due to the fluorine of either the intermittently imbibed water or the continuously present fluorine of the saliva. The only concentration of fluorine in the mouth high enough to retard bacterial growth is *in* the enamel and it would seem illogical to invoke fluorine in such an immobile state to be effective. It would seem that fluorine could only retard the activities of bacteria by entering into their cells.

It is of interest in the relation of fluorine to plaques and caries that Day[20] found plaques on the teeth of 309 of 314 children of whom 74 per cent had mottled enamel and an incidence of only 0.62 carious cavities. This indicates that certain plaque organisms can exist in contact with a high content of fluorine. The organisms in these plaques, however, may not have been those which are associated with dental caries.

It is to be noted that the concentrations of fluorine used in topical applications[14, 7] have been of the order of, or in excess of the 250 p.p.m. stated to retard bacterial development.[8] It is therefore possible that the fluoride solutions have had a sterilizing influence on the flora of the teeth. If bacteria in undetected beginning caries were destroyed, a reduction later in new cavities would possibly result. If a control series in these experiments with a nonfluoride bactericidal agent had been used, the specific action of fluorine would have been tested. The value of topically applied fluorine in explaining the true action of lowered incidence of caries in areas with fluorine containing waters is therefore questionable.

Dean, et al.[22] noted that caries in the upper anterior teeth was prevented much more by fluoride waters than caries in the molars. Volker[50] was the first to suggest that this phenomenon was because of greater contact of the anterior teeth with water in the act of drinking. Anderson has described mottled enamel among Chinese[1] and dental caries.[2] (Dr. Anderson, in a personal communication, has stated that the two reports dealt with the same group of Chinese.) In the *permanent* teeth the pattern of decay was that observed by Dean, et al., with only 4 of 3,211 upper incisors affected. But in the *deciduous* dentition the rate of decay of anterior teeth was at a much higher rate than in the permanent teeth and was not different from that of the molars. This would imply that the con-

tact with drinking water is not the true explanation of the low rate of caries in anterior compared with posterior teeth.

Unfortunately the reports of Dean and his coworkers and of Anderson do not show the incidence of decay in specific areas of the teeth. It may be suspected that decay is restricted to pits and fissures of the molars and that the lateral surfaces would be as free of caries as are the upper incisors. If this were found to be true in future studies, the better explanation of this aspect of fluorine prevention of caries would be from preëruptive influences. The oral environmentalist explains the occurrence of caries in well recognized vulnerable areas such as in the pits and fissures of molars and in inter-proximal sites as due to retention of food. This explanation is satisfactory for the promotion of caries once initiated but fails in the face of the erratic incidence of decay in adjacent teeth. Bödecker and Ewen [13] reported: "An examination of 516 full mouth x-rays, selected at random showed 179 carious lesions affecting only one of two closely contacting teeth. This condition (unilateral caries) indicates that food retention, bacteria, and saliva cannot be the *sole* factors in dental destruction." They indicated belief in variable resistance of the teeth. Such variable resistance could well be due to variations in available fluorine during formation of the teeth. If it were shown that adjacent teeth have different levels of fluorine plus the related resistance to caries this situation could only be explained by preëruptive influences including variations in the fluorine supply.

Cox [17] discussed fluoridization of community water supplies with seasonal variation according to water consumption so as to provide for a constant year round intake of fluorine. The reason for such constancy was to maintain as high a level of fluorine intake as possible without causing mottled enamel, with the expectation of forming enamel with the greatest resistance to caries. Other proposals to add fluorides to water, such as those of Ast,[5] provide for a year round level of 1 p.p.m. of fluoride. This method provides for a constant level of fluorine for oral environment but a variable amount from the viewpoint of nutrition. This method of providing 1 p.p.m. of fluorine is being applied now in several communities.

One of the precepts of current studies [5] on the addition of fluorides to community water supplies is that a period of years must elapse before results can be known. Certainly this is not true if the action of the fluorine is on the oral environment, and reports dealing with that phase should soon be forthcoming. But if the action is through formation of caries-resistant enamel, that is, through a nutritive mechanism, the results cannot be known for years.

It is not necessary to wait for the outcome of experiments on human populations to determine the detrimental effects, if any, of adding fluorine to water supplies. The field pioneered by Dean, et al.[22] remains almost unexplored as to other than dental effects of fluorine and proper investigation can be made at once on populations with long exposure to fluoride waters.

Dean and his associates confined their attention to children of continuous residence in the communities they examined. If they had included migrants at various ages, they could have cast much light on the permanance of fluorine in preventing caries or, in other words, could have determined whether it is a matter of oral environment or of nutrition. Such studies should include the examination of children moving into and out of communities where experimental additions of fluorine to water supplies are being made.

The mechanism by which fluorine protects teeth remains unknown. It appears, at least in the anterior teeth, to prevent caries in the sense that no decay appears.

This would seem to indicate that it prevents initiation of decay. Once caries is initiated it may progress less rapidly in teeth with increased fluorine, but the fact that mottled enamel teeth become carious[3, 36] indicates that the fluorine content of the teeth acts neither to inhibit bacterial life nor solution of the enamel by the acids formed by microorganisms.

It would seem wise to return to the view of Miller[39] that structure of the enamel is a factor determining whether or not a tooth surface will become carious. The structure, so far as it is influenced by fluorine, should be viewed as acting to resist caries either because of a part played by fluorine in its make-up or by an effect of fluorine on the cells that deposit the enamel. In the latter case, the increased fluorine content of the enamel would be only adventitious.

It is fortunate for oral environmentalists that they are divided in general in their philosophy only as to the identity of the microörganisms that "cause" dental caries. If an organism specific for dental caries exists, immunization against the disease might be possible if such immunity could be induced upon the oral cavity. Such immunization has not been achieved and hence the matter of a specific organism remains only of academic importance.

It is unfortunate for the millions of sufferers from dental caries that the oral environmentalists prefer their unanimity of opinion that any tooth will decay if only carbohydrates and acid-forming bacteria are in contact with it, and reject the viewpoint that resistance to caries can be built into the enamel by nutrition. Their assurance, based largely upon observations in the Petri dish, blocks proper collection and analysis of data on dental caries, such as the frequency of attack in specific areas. Since bacteriologists can most readily collect saliva and plaque specimens from human mouths, they have not made large use of experimental animals. Therefore, they tend to reject the evidence from the albino rat that initiation of caries may differ in its mechanism from further development of a cavity.

It is unfortunate that nutritionists are divided in their philosophy in the field of dental caries. A major schism exists in the matter of pre- and post-eruptive effects of nutrition on dental caries. This is of primary importance as affecting the way in which fluorine as well as calcium, phosphorus, and vitamins A, C, and D are applied in relation to dental caries. Nutritionists seem content to accept and analyze the data of dental caries on a whole mouth basis in the manner of the oral environmentalist rather than by the area by area method that challenges the theories of both these opposing groups. Nutritionists have not yet declared fluorine an essential factor in caries. This withholding of opinion is undoubtedly because of the prior knowledge of its toxicity, uncertainty of the mechanism in its prevention of caries, and, also because teeth themselves may not be regarded as essential. But it is fortunate for the millions of sufferers from dental caries that division of opinion exists among nutritionists since from such conflicts and doubts come the stimuli for research that will eventually lead to methods to prevent, as well as control, dental caries.

Large-scale experiments are now being conducted in several localities on the effects on dental caries of the addition of fluorine to the community water supplies. These additions are being made on the oral environment basis of a uniform level throughout the year, and the level is held low because of fear of producing mottled enamel and other possible injuries. Dosage cannot yet be made on a nutritional basis, except by guess, because the necessary knowledge is lacking on (a) the optimum requirement for fluorine and (b) the variability of the intake of drinking water by

children in relation to season. The constant level procedure of the fluoridization of water supplies, however, will provide a test of the general effectiveness of fluorine in the prevention of dental caries. It is to be hoped that those in charge of the studies (a) will report the data on frequency of caries in specific areas of the teeth and not on a whole tooth basis, (b) that the original data will be made available, and not suppressed by resort to expression by rates, and (c) that especial attention will be given to individuals who have varying degrees of exposure to fluoride-bearing waters. Such data will aid in the decision as to the degree in which fluorine acts as an element in nutrition and in oral environment.

If it should be shown eventually that fluorine acts through channels generally viewed as nutritional, this finding should not be permitted to cause acceptance of all other factors that may be related to dental caries through nutrition, nor should it be allowed to diminish the importance of the oral environmental factors in development of cavities in teeth that are not conditioned to resist dental caries.

REFERENCES

1. Anderson, B. G. An Endemic Center of Mottled Enamel in China. *J. Dent. Research*, 12:591, 1932.
2. Anderson, B. G. A Study of the Incidence of Dental Caries in One Thousand Chinese. *J. Dent. Research*, 12:709, 1932.
3. Armstrong, W. D., and Brekhus, P. J. Chemical Composition of Enamel and Dentin. II. Fluorine Content. *J. Dent. Research*, 17:27, 1938.
4. Armstrong, W. D., and Brekhus, P. J. Possible Relationship Between the Fluorine Content of Enamel and Resistance to Dental Caries. *J. Dent. Research*, 17:393, 1938.
5. Ast, D. B. The Caries-Fluorine Hypothesis and a Suggested Study to Test Its Application. *Pub. Health Rep.*, 58:857, 1943.
6. Baumgartner, E. Die Zahnkaries—eine Streptomykose. *Wien klin. Wchnschr.*, 26:178, 1913.
7. Bibby, B. G. Preliminary Report on the Use of Sodium Fluoride Applications in Caries Prophylaxis. *J. Dent. Research*, 21:314, 1942.
8. Bibby, B. G., and Van Kesteren, M. The Effect of Fluorine on Mouth Bacteria. *J. Dent. Research*, 19:391, 1940.
9. Bibby, B. G., Volker, J. F., and Van Kesteren, M. Acid Production and Tooth Decalcification by Oral Bacteria. *J. Dent. Research*, 21:61, 1942.
10. Black, G. V. Dr. Black's Conclusions Reviewed Again. *Dental Cosmos*, 40:440, 1898.
11. Black, G. V., with McKay, F. S. Mottled Teeth: An Endemic Developmental Imperfection of the Enamel of the Teeth Heretofore Unknown in the Literature of Dentistry. *Dental Cosmos*, 58:129, 1916.
12. Blayney, J. R., Kesel, R. G., and Wach, E. C. Dental Caries. I. New Method of Studying Bacterial Plaque. *J. Dent. Research*, 15:326, 1935.
13. Bödecker, C. F., and Ewen, S. The Incidence of Unilateral Dental Caries in 516 Cases. *J. Dent. Research*, 16:401, 1937.
14. Cheyne, V. D. Human Dental Caries and Topically Applied Fluorine: A Preliminary Report. *J. Am. Dent. A.*, 29:804, 1942.
15. Clarke, J. K. On the Bacterial Factor in the Aetiology of Dental Caries. *Brit. J. Exper. Path.*, 5:141, 1924.
16. Cox, G. J. Nutrition and Dental Caries in Rats. Abstracts, Sub-Sect. Dentistry, Am. Assoc. Advancement Sci., 1938.
17. Cox, G. J. New Knowledge of Fluorine in Relation to Dental Caries. *J. Am. Water Works A.*, 31: 1926, 1939.
18. Cox, G. J. The Fluorine and Dental Caries Problem. *J. Am. Dent. A.*, 27:1107, 1940.
19. Cox, G. J., Matuschak, M. C., Dixon, S. F., Dodds, M. L., and Walker, W. E. Experimental Dental Caries. IV. Fluorine and Its Relation to Dental Caries. *J. Dent. Research*, 18:481, 1939.
20. Day, C. D. M. Oral Conditions in the Famine District of Hissar. *J. Am. Dent. A.*, 31:52, 1944.
21. Dean, H. T., Arnold, F. A., Jr., and Elvove, E. Domestic Water and Dental Caries. V. Additional Studies on the Relation of Fluoride Domestic Waters to Dental Caries Experience in 4,425 White Children, Aged 12 to 14 Years, of 13 Cities in 4 States. *Pub. Health Rep.*, 57:1115, 1942.
22. Dean, H. T., Jay, P., Arnold, F. A., Jr., McClure, F. J., and Elvove, E. Domestic Water and Dental Caries, Including Certain Epidemiological Aspects of *L. acidophilus*. *Pub. Health Rep.*, 54:862, 1939.
23. Eager, J. M. Denti di Chiaie (Chiaie Teeth). *Pub. Health Rep.*, 16:2576, 1901.
24. Gies, W. J., and Kligler, I. J. Chemical Studies of the Relations of Oral Microörganisms to Dental Caries. 2. A Biochemical Study and Differentiation of Oral Bacteria with Special Reference to Dental Caries. *J. Allied Dental A.*, 10:141; 282; 445, 1915.
25. Goadby, K. W. Microörganisms in Dental Caries. *J. Brit. Dental A.*, 21:65, 1900.
26. Hartzell, T. B., and Henrici, A. T. The Pathogenicity of Mouth Streptococci and Their Rôle in the Etiology of Dental Diseases. *J. Nat. Dent. A.*, 4:477, 1917.
27. Hill, T. J. The Influence of Saliva upon the Growth of Oral Bacteria. *J. Dent. Research*, 18:214, 1939.
28. Hodge, H. C. Some Dietary Studies on Rat Caries. *J. Dent. Research*, 23:207, 1944.
29. Howe, P. R., and Hatch, R. E. A Study of the Microörganisms of Dental Caries. *J. Med. Research*, 36:481, 1917.
30. Jay, P. The Problem of Dental Caries with Relation to Bacteria and Diet. *J. Pediat.*, 8:725, 1936.
31. Kendall, A. I. Observations on Aciduric (Acidophilic) Bacteria. *J. Med. Research*, 17:153, 1910.
32. Lilly, C. A. Failures to Produce Experimental Dental Caries in the White Rat with High Carbohydrate Diet and Bacillus Acidophilus or with Vitamin D Deficiency. *J. Nutrition*, 5:175, 1932.
33. Lilly, C. A., and Associates. Report of Experimental Work on the Relation of Dietary Deficiencies to the Etiology of Dental Caries in Albino Rats.

Abstracts, Sub-Sect. Dentistry, Am. Assoc. Advancement Sci., 1938.

34. McClure, F. J. Domestic Water and Dental Caries. III. Fluorine in Human Saliva. *Am. J. Dis. Child.*, 62:512, 1941.

35. McIntosh, J., James, W. W., and Lazarus-Barlow, P. An Investigation into the Etiology of Dental Caries. I. The Nature of the Destructive Agent and the Production of Artificial Caries. *Brit. J. Exper. Path.*, 3:138, 1922.

36. McKay, F. S. in *Dental Caries.* Advisory Committee on Research in Dental Caries. American Dental Assoc., New York, 1941.

37. Miller, B. F. Inhibition of Experimental Dental Caries in the Rat by Fluoride and Iodoacetic Acid. *Proc. Soc. Exper. Biol. & Med.*, 39:389, 1938.

38. Miller, W. Der Einfluss der Mikroorganismen auf die Caries der menschlichen Zähne. *Arch. Exper. Path.*, 16:291, 1882.

39. Miller, W. D. Caries of the Human Teeth. *Independent Practitioner*, 4:629, 1883.

40. Miller, W. D. *Die Mocroorganismen der Mundhöhle.* Leipzig, 1889; (*The microorganisms of the human mouth.*) Philadelphia, 1890.

41. Miller, W. D. The Presence of Bacterial Plaques on the Surface of Teeth and Their Significance. *Dental Cosmos*, 44:425, 1902.

42. Moro, E. Ueber die nach Gram färbbaren Bacillen des Säuglingsstuhles. *Wien. klin. Wchnschr.*, 13:114, 1900.

43. Morozzo, C. L. Sopra i denti fossili di un elefante trovato nelle vicinanze di Roma. Memorandum. *Mem. mat. fis. soc. Italiana sci.*, 10:162, 1803.

44. Niedergesäss, K. Anatomische, bacteriologische and chemische Untersuchungen über die Entstehung der Zahnkaries. *Arch. f. Hyg.*, 84:221, 1915.

45. Rodriguez, F. E. Studies in the Specific Bacteriology of Dental Caries. *Military Dental J.*, 5:199, 1922.

46. Sieberth, O. Die microorganismen der kranken Zahnpulpa, Thesis, Erlangen, 1900.

47. Smith, M. C., Lantz, E., and Smith, H. V. The Cause of Mottled Enamel. *Science*, 74:244, 1931.

48. Sperling, H. Der Streptococcus lacticus (Kruse) in seiner Beziehung zur Zahnkaries. *Deutsch Monatschr, f. Zahn.*, 40:129, 1922.

49. Theriault, E. J. Water, Sewage, and Sanitary Chemistry. *Indust. Engin. Chem., News Ed.*, 9:105, 1931.

50. Volker, J. F. Effect of Fluorine on Solubility of Enamel and Dentin. *Proc. Soc. Exper. Biol. & Med.*, 42:725, 1939.

51. Williams, J. L. A Contribution to the Study of Pathology of Enamel. *Dental Cosmos*, 39:169; 269; 353, 1897.

52. Williams, N. B. Immunization of Human Beings with Oral Lactobacilli. *J. Dent. Research*, 23: 403, 1944.

53. Wright, H. D. The Effect of Iodoacetic Acid, Fluoride, Phloridzin and Phenol on Bacterial Fermentation: A Further Consideration of the Fermentation of Disaccharides. *J. Path. & Bact.*, 45:117, 1937.

Signs of Progress in Dental Health*

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IT is considered good practice to pause occasionally in the performance of our duties in order to take stock of our achievements or failures. When we make such an appraisal of efforts to prevent or control dental diseases, or to find a means of providing dental treatment for all persons who need dental care, it is easy to become skeptical of our chances to achieve these goals in our time. The almost universal distribution of dental disease in the population, and the limited preventive and treatment facilities available to combat these diseases, are not conducive to a high degree of optimism in the search for a satisfactory solution to the problem.

On the other hand, an evaluation of progress and an estimate of future achievements can be regarded in a more favorable and hopeful light when we take into account the relatively short period of time during which the dental and public health professions have studied and attacked the dental disease problem from a public health point of view. It has been only during recent years that we have begun to study the occurrence of dental disease according to accepted epidemiological standards, and have attempted to apply public health methods to the problem. While the accomplishments of the last few years are admittedly of modest proportions, the outlook for greater achievement in the years immediately ahead is certainly more favorable than it was 10 years ago. The extent of our progress during the next decade will depend in large measure on how fully we use our available facilities and knowledge, as well as on the development of new resources.

The American Dental Association, through its Council on Dental Health, unquestionably can make a contribution in this direction. The American Dental Association and its component societies are in position to carry out many activities that are important adjuncts to the total effort in dental health promotion and which could not be as readily undertaken by other agencies. For example, no other organization has an equal opportunity, or perhaps an equal responsibility, to conduct a longitudinal study of the dental health problem, to create an informed dental profession in matters related to dental health advancement, and to secure the coöperation of individual dentists and dental societies in community health planning. The Council on Dental Health has recognized the need for such action and is now engaged in the development of several projects designed to utilize more fully the resources of the dental profession in the promotion of dental health.

DENTAL HEALTH WORKSHOP

There has been much discussion in recent months about plans which might be adopted nationally to provide a wider distribution of health care. At the moment it semes likely that proposals to expand local health services will receive more general support than will a nation-wide insurance plan. It is also

* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

quite likely that the provisions of S.1099, which was introduced in the last Congress, may be adopted eventually in either a separate bill or as a part of other legislation. If funds become available to expand dental services for children, and to develop and maintain educational programs and demonstration projects, a mechanism will be needed to secure the support and advice of local agencies. Obviously, state and local councils on dental health should participate in the formulation of community dental health plans.

The A. D. A. Council on Dental Health intends to sponsor a series of workshops as a continuing activity, so that individual dentists and state and local councils on dental health may have an opportunity to consider the dental health problem in their own areas, and so that the dental profession may be in a better position to provide technical advice. Workshops have been used successfully for a number of years in the educational and civic improvement fields. In general terms, the purpose of the workshop is to bring together a group of individuals who are interested in solving a particular problem so that they can examine objectively all the facts which make up the problem and adopt recommendations for a plan of action. Usually a workshop is conducted for a period of one or more weeks, but since dentists would probably find it impossible to leave their offices for such a lengthy stay, the dental health workshops will be concentrated into three day meetings.

The three day conference will be divided into three major sessions. On the first day five or six speakers will present basic facts objectively; factual data will be outlined without an expression of personal opinion as to how the problem should be solved. The second day will be devoted to group discussions which would permit a more intensive examination of (1) the possibilities of utilizing and expanding dental personnel and ancilliary aids, (2) the establishment of desirable features of a community dental health program, (3) the establishment of responsibilities of groups and agencies for the promotion of dental health, and (4) recommendations for experimental or demonstration projects.

Through this procedure the members of the dental profession will have an opportunity to examine critically, through group discussions, a number of important questions, such as:

1. Is it desirable to increase dental personnel so that all persons who need dental service will receive it?
2. What methods should be adopted to secure an even geographic distribution of dentists in relation to the distribution of the population?
3. Should the Alabama plan of providing scholarships for dental students from each county be adopted by all states?
4. To what extent should the number of hygienists, technicians, dental nurses, and assistants be increased?
5. What should be the long-range objectives of a community dental health program?
6. What basic plans should govern the establishment and maintenance of dental health programs for the public?
7. Should a community dental health program include provisions for dental care?
8. If so, who should receive dental care in an organized plan? How should a dental care plan be financed? Should the dental care plan be limited to indigents? What criteria should be used to establish a means test?
9. What are the responsibilities of the dental profession in the organization and maintenance of a community dental health program?
10. What are the responsibilities of the city and county governments in supporting a dental health program?
11. What are the responsibilities of public school systems in promoting dental health?
12. What responsibilities can be delegated to lay committees?
13. What types of experiments or demonstrations conducted as community projects would aid in the adoption of methods for (a) preventing dental diseases, (b) educating the public in dental health matters, and (c) providing dental care for a larger number of people?

When the dental profession, through objective discussion and deliberation, has had an opportunity to study these questions, it should be in a better position to assist other health agencies in the establishment of community health programs. The Council on Dental Health believes that a continuing series of dental health workshops will prove to be very important and fruitful activities.

ANNUAL CONFERENCE OF STATE COUNCILS

As a projection of the workshop idea, conferences of state councils on dental health will be held during the annual meetings of the American Dental Association. Approval has been secured from the officers of the A. D. A. for the organization of annual conferences to be patterned after the State Officers' Conferences. These sessions will be planned to present and discuss the actions and findings of state councils on dental health. Through this procedure the state and component societies will have opportunities to exchange opinions and to enter into free discussions of the policies of the American Dental Association, as well as the national aspects of dental health planning.

The first annual conference of state councils will be held in Boston during the 1947 annual meeting of the American Dental Association. There is every reason to believe that the series of workshops and the annual conferences of councils will establish a mechanism for creating an informed dental profession and for securing active participation in dental health promotion.

SCHOOL DENTAL HEALTH MANUAL

The Council on Dental Health has recently prepared a manual to be used as a guide in the establishment and maintenance of dental health programs in elementary and secondary schools. This manual has been developed in response to a considerable number of requests from members of state councils on dental health. The A. D. A. Council was informed that local dental groups could be of more direct service as members of school and community planning committees if reference material were made available to guide them in recommending policies and procedures for school dental health programs. The manual outlines accepted school health practices, organizational and administrative technics, and the responsibilities of dentists, school officials, health officers, and nurses in organizing and conducting school health programs. The manual has been submitted to public health dentists and other health workers for comment and criticism. The final revision is now being printed and will be available for free distribution soon.

DENTISTRY'S PARTICIPATION IN THE WORLD HEALTH ORGANIZATION

The International Health Conference held in New York City in June, 1946, resulted in a recommendation to establish a World Health Organization under the auspices of the Economic and Social Council of the United Nations. A number of technical advisers to the United States delegates were selected from the personnel of the Department of State, U. S. Public Health Service, American Medical Association, American Pharmaceutical Association, Bureau of the Budget, Federal Security Agency, and National Nursing Council.

While it may not have been practical to include at least one dental representative as an adviser to the United States Delegation attending the International Health Conference, it would be desirable to provide for dental representation during conferences of the World Health Assembly in the future. This would seem valid in view of the fact that dentistry is an integral part of any general health service and that many of the health problems which will come up

for discussion will encompass dental implications. This assumption can be applied specifically to the functions of the organization dealing with:

1. the promotion of coöperation among scientific and professional groups which contribute to the advancement of health,
2. the promotion of maternal and child health and welfare,
3. the promotion of research in the field of health,
4. the promotion of improved standards of teaching and training in public health, medicine, and related professions,
5. the study and report, in coöperation with other specialized agencies, of administrative and social technics affecting public health and medical care from preventive and curative points of view, and
6. the creation of an informed public opinion among all people on matters of health.

In recognition of the fact that the prevention and control of dental diseases constitute an essential part of a total health program, and therefore, that competent dental representatives should be available to the participants in the World Health Assembly, the American Dental Association has recommended the appointment of dental representatives from each of the member nations as dental advisers to the delegates.

This recomendation will be filed with the officials of the World Health Organization and the officials of the United States Government within the very near future.

DENTAL HEALTH GOALS

The deliberations of the Council on Dental Health have revealed that the objectives of the American Dental Association for promoting dental health have not been revised since the adoption of the recommendations proposed by the National Health Program Committee in 1939. The Council has decided that much could be gained by a restatement of the objectives based on the conditions and trends of today. This has resulted in the following statement of goals approved by the House of Delegates during the meeting in October 1946:

1. The prevention of dental diseases through the application of preventive technics as soon as they are demonstrated to be scientifically valid; the support of intensified dental research with adequate funds, personnel, and facilities.
2. The control of dental diseases by the expansion of community dental programs, integrated into the general health program, to provide every child with dental care and dental health education, regardless of income or location. These programs should be maintenance programs centered on the control of the annual increment of new dental diseases in children.
3. The provision of additional facilities and uniform standards for dental care by making dental services available in hospitals and health centers for inpatients and outpatients.
4. The recruitment of an annual enrollment of dental students equal to the capacity of all dental schools to increase the number of qualified dentists.
5. The adoption of measures to make dental practice in smaller cities and rural areas more attractive and rewarding in order to secure a better distribution of dentists.
6. The employment of dental hygienists as ancillary aids to the dentist; the provision of adequate training courses and training facilities for dental hygienists to prepare them as ancillary aids within prescribed legal limitations, and additional courses for those who desire to qualify for positions in public health departments and schools.

The statement dealing with the approval of dental hygienists as ancillary aids represents the first official action of the American Dental Association in recommending that suitable dental hygienist practice acts be established in all states.

DECENTRALIZATION OF AUTHORITY

It has been the common experience of dental health workers that the use of a means test to determine eligibility for dental service at public expense almost always becomes an issue in planning for

community dental health programs. Congress is being confronted with the same question in considering legislation which provides for grants-in-aid to the states. It will be recalled that the Taft Bill, S.2143, specifically required the inclusion of a means test in the approval of state plans. The Children's Bureau Bill, S.1318, specifically provided that a means test should not be used in making health services available to mothers and children in programs financed by funds under this Act.

For a number of years the American Dental Association has maintained that the community in all cases shall determine the methods for providing service within its area. In further support of this policy, the American Dental Association recently reaffirmed its stand by adopting a resolution providing that the decision on the employment of a means test in public health programs should be delegated to the state or community and should not be incorporated into federal legislation.

AUTHORITATIVE DENTAL INFORMATION

For a number of years dentists have commented on the many inaccurate and misleading statements on dental health matters which appear in public school textbooks. Frequently textbooks contain information directly at variance with that which appears in health education literature distributed by the dental profession. In order that this situation may be remedied as far as possible, the American Dental Association intends to augment its services to publishers by employing a competent dental health education specialist who will be assigned the task of editing and evaluating the dental context of publications for school children.

REMUNERATION FOR PUBLIC HEALTH DENTISTS

Realizing that the effectiveness of dental health programs administered by official health agencies will depend in large measure on the caliber of public health dentists employed by those agencies, the Council on Dental Health has been deeply concerned by the fact that a large number of qualified public health dentists have resigned their positions with state and municipal health departments. There can be no question that the chief reason for these resignations has been the opportunity for more adequate remuneration in other fields. In an effort to correct this situation, The Council on Dental Health will attempt to secure the assistance of state dental societies in taking suitable action, through legislative measures if necessary, to obtain higher rates of pay for dental positions in state and local health departments.

HEALTH PRACTICE INDICES

The Committee on Administrative Practices of the American Public Health Association publishes a record of public health practice which is compiled from evaluation schedules submitted by local health officers. It is unfortunate that the accomplishment of workers in the dental health field are reported so ineffectively in these *Health Practice Indices*. Dental health activities cannot be judged accurately nor can their effectiveness be fairly measured by the presently used appraisal forms. The Central Office of the American Public Health Association has recently invited the A. D. A. Council on Dental Health to suggest an improved method of recording activities and results. The Council believes that this matter should be referred to public health dentists, and is therefore requesting the Dental Health Section of the American Public Health Association and the American Association of Public Health Dentists to assist in the adoption of recommendations for improving the dental health evaluation schedule for use in the study and appraisal of community health programs.

CONCLUSION

The above considerations outline the current actions and proposals of the Council on Dental Health. There is every reason to believe that, if the projects prove as successful as the Council hopes, the dental profession will be taking increasing interest in utilizing more adequately all of the available resources toward the promotion of dental health.

An Epidemic of Diarrhea in a New-Born Nursery Caused by Pseudomonas aeruginosa*

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THIS report deals with an epidemic of diarrhea in infants that occurred in 1945 in the St. Rose Hospital (135 beds) at Great Bend, Kans., (10,000 population). The State Board of Health was notified of this epidemic on October 1. Investigation revealed that there had been occurrence and recurrence of diarrhea in the nursery and in infants dismissed from the nursery since June. Information was also obtained that there had been cases of diarrhea in the community and neighboring community for several months.

There were 24 infants who had either developed this disease in the hospital nursery, or had developed it after leaving the nursery, and then had returned to the hospital. In these 24 cases, there were 9 deaths. During this period of time there had been 278 births in the hospital.

Out of the 24 cases, considered in this report, 15 developed in the nursery, while 9 cases had been discharged from the hospital and returned. Of these 9 cases, 7 gave history of contact with a case of gastroenteritis at home; one returned to the pediatric ward because of feeding difficulty and 7 days later developed diarrhea, simultaneously with the development of several cases in the nursery. The ninth case developed symptoms the day it left the hospital. A total of 19 probably contracted the disease in the hospital.

Diarrhea was the first, and often the only symptom, which might vary from a few soft frequent stools to extreme watery ones. The next most common symptom was vomiting, then dehydration, cyanosis, collapse, pain and fever, in that order. In 3 infants who died, early and extreme setting of the muscles in rigor mortis occurred. In many of the cases, diarrhea seemed to be recurrent over periods of time as great as 6 weeks, just as it was in some of the adult cases. The period of incubation varied from 1 to 7 days, most commonly 6. Only one case had an onset less than 4 days after birth; the onset in this case was 3 days.

From the epidemiological study the following points can be noted:

1. There were 6 outbreaks in the nursery with the development of from 1 to 6 cases in each outbreak.
2. These outbreaks were separated by periods of 15, 7, 49, 31, and 10 days.
3. In each outbreak, all the primary cases in the nursery occurred in one or two consecutive days. There were no secondary cases except that possible August outbreak.
4. Prior to every outbreak in the nursery, except the one in August, one mother or nurse on the obstetric floor developed the disease. In the August and October outbreaks, mothers

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

had had the disease shortly before entering the hospital.

5. In every case where the mother had had the disease, her infant developed it.

6. One mother who did not have diarrhea came from a family in which two children did.

7. Several cases of gastroenteritis developed in other parts of the hospital, in medical, in pediatric, and surgical cases, and in 24 nurses and Sisters.

The hospital nursery had been very crowded of necessity, housing three times the number of infants it was built to accommodate. A proportionately large number of premature infants was in the nursery. A shortage of professional personnel existed. Consequently, there were some breaks in technic, but they were not gross breaks which would explain the epidemic.

The nursery outbreaks can be explained on the basis of secondary infection from infected mothers or nurses. It was proved that they were carriers of the organism causing the infection. The only condition which would cause such a large group of carriers is the ingestion of a contaminated food or water.

In addition to the infected mothers or nurses, there were several hundred cases of diarrhea in the community (histories were obtained on more than 400 which occurred betwen July 1 and October 15), and several cases occurring in outlying communities. The hospital, the city, and the outlying communities, had separate water supplies.

The only foods common to the hospital and city, which were not cooked before use in the hospital, were bread, lettuce, cold meats, and milk. The only persons who developed diarrhea in the outlying communities were using pasteurized milk from a dairy in Great Bend which also supplied the hospital. Only 21 of the 24 mothers could be contacted, but the one food all 21 used at the hospital was milk. Two of these developed diarrhea before entering the hospital, but they bought milk from the same dairy.

From an epidemiological standpoint, a contaminated milk supply which had never been adequately controlled was the source of the infection. Milk for 90 per cent of the community came from 2 dairies which was labelled pasteurized milk. Inspection revealed both to be filthy, filled with flies; to have dogs in the milk room; to lack handwashing facilities; to have dust blowing in; to have no recording thermometers on the pasteurizing vats, and in one dairy a rag had been tied over a leak in a water pipe directly over the cooling coils. From this rag, water dripped into the pasteurized milk. *Pseudomonas aeruginosa* was isolated from the water dripping off of the rag. A heavy collection of milkstone on the pipes testified to the fact that they had not been properly cleaned for months. The bacteriological examination of the milk which consisted of the standard plate count, microscopic examination, coliform determinations, and phosphatase tests showed that more than 22 per cent of the samples of pasteurized milk from plant A had a standard plate count of over 3,000,000. Pasteurized milk from plant B had an average Standard plate count of 110,000. The phosphatase tests showed that 7 per cent of the samples from plant A were insufficiently pasteurized, and 23 per cent of the samples from plant B were not sufficiently pasteurized.

There were three different sources of water for the community; hospital, city, and private wells. The hospital had its own water supply and bacteriological examinations showed the water to be free of coliform organisms and *Pseudomonas aeruginosa*.

The city water supply (17 samples) did not show the presence of coliform or *Pseudomonas aeruginosa*. It is chlorinated continuously and tested regularly under the supervision of the

State Board of Health. It is estimated there are some 1300 private water supplies in Great Bend. Upon inspection by the sanitary engineers, none were found cross-connected to the city water. Seventy-two samples of water from private wells were examined and coliform organisms found in 16 of them. *Pseudomonas aeruginosa* was isolated from 4 wells.

The bacteriological study of the cause of illness and deaths of infants in the St. Rose Hospital, Great Bend, was started on October 1, 1945. A complete laboratory was set up in the hospital and 3 bacteriologists from the State Public Health Laboratories were assigned to study this epidemic. Stool specimens were obtained from all sick and some normal infants; from hospital nurses and employees; from mothers, and from residents of Great Bend that were sick or had recently been sick. Rectal swabs were used to collect the specimens except in some cases of the infants. The stools were plated directly on SS agar, MacConkey's agar, and desoxycholate agar. Tetrathionate broth and Selenite F broth were also used as enrichment media. All suspicious colonies were fished off into Kligler iron agar. These cultures were then sent to the Central Public Health Laboratories, Topeka, where complete study and identification were made.

Because of the clinical symptoms of the disease in some infants, and of the history of a sick father who returned by airplane from overseas, efforts were made to isolate all types of organisms, even *Vibrio comma*. Although *Pseudomonas aeruginosa* was isolated from the first case seen on October 1, it was difficult to believe this was the etiological agent, therefore, every effort was used to isolate all other possible organisms. Streptococci, both aerobic and anaerobic, were looked for in addition to the above mentioned group of organisms. Besides isolating *Pseudomonas aeruginosa* from the infants, it was also possible to extract pyocyanine from the stools. More than five hundred stool specimens were examined.

Summary of Bacteriological Examinations

1. Infants under 2 years of age	38
Pseudomonas aeruginosa isolated	24
2. Infants followed clinically	24
Number studied bacteriologically	9
Pseudomonas aeruginosa isolated	9
3. Normal infants studied	13
Pseudomonas aeruginosa isolated *	5
4. Autopsies on infants	2
Pseudomonas aeruginosa isolated from liver, spleen, gall bladder, and intestines	2
5. Rectal swabs on nurses and hospital employees	103
Pseudomonas aeruginosa isolated	16
Eberthella typhosa isolated	1
Shigella alkalescens isolated	2

* Four of the 5 infants became sick later and 1 left the hospital and could not be followed, but *Pseudomonas aeruginosa* had been isolated from the mother.

In addition to the results given above, a large number of Proteus and Salmonella-like cultures were isolated which were classified as belonging to the paracolon group. More than seven hundred cultures were studied. The identification consisted of cultural, biochemical, and typing for antigenic characteristics.

It is interesting to note that nurses in the nursery and pediatrics were carriers of *Pseudomonas aeruginosa*. Another finding of interest was the isolation of *Eberthella typhosa* from one of the nurses.

TREATMENT

The treatment before isolation of the organism had consisted of penicillin, transfusions, parenteral fluids, and sulfa drugs; the last two were the most effective. Following isolation of *Pseudomonas aeruginosa*, a review of the literature revealed that it produced small amounts of hydrocyanic acids. It was conceivable that the symptoms could be attributed to slow poisoning from this source. Proceeding upon this assumption, methylene blue—which had often been used effectively in this type of poisoning, was suggested as a treatment. One of the physicians used it and reported miracu-

lous results with clearing of cyanosis and signs of toxicity in less than 10 minutes. This affords a therapeutic test which supports the rest of the work.

MEASURES TAKEN TO STOP THE EPIDEMIC

1. The hospital autoclaved all milk until a safe milk supply could be obtained.

2. Whenever possible, stool cultures were made on mothers 2 weeks before they entered the hospital. Upon entry, another stool culture was made and the mothers were questioned concerning a history of diarrhea.

3. Whenever a positive stool culture was obtained, or the mother had a history of diarrhea within the past 2 weeks, or developed diarrhea on the obstetric floor, the mother was isolated on a separate floor, and the infant was taken from the nursery and also isolated from the mother. If a history of diarrhea or a positive stool culture was obtained before entrance, the mother was delivered in her own room.

4. When an infant developed the first suspicious sign of diarrhea, the mother and infant were isolated as above, and the physician notified so that treatment might be started on the infant.

5. Another room was set up for a nursery and all new infants placed in this room until all the infants in the original nursery had been discharged and the nursery could be thoroughly cleaned.

6. All mothers and infants were sent home on the fourth day routinely. The public health nurse was notified when the mother and infant were dismissed from the hospital so that a visit could be made to give the mother instructions on the care of the baby and techniques which should be used to prevent infection. If, on the fourth day, the infant showed signs of diarrhea, he was sent to pediatrics rather than home. If, for some reason, the mother or infant had to stay in the hospital more than 4 days, the mother and infant were placed in a private room and the infant kept out of the nursery.

7. Public health nurses were assigned to assist mothers leaving the hospital with newborn infants, to put into practice every precaution to safeguard infants from infection.

8. Stool cultures were repeated on all nurses in the nursery, and pending report, all nurses who had had diarrhea in the last month were removed from the nursery.

The epidemic subsided within 3 weeks after these measures had been put into effect.

SUMMARY

1. This is a report of an epidemic of diarrhea in 24 new-born in which there were 9 deaths. Eighteen of these probably contracted the disease in the new-born nursery. One was discharged, returning to the hospital as a feeding problem, and developed diarrhea 7 days later. Five developed diarrhea at home after being in contact with a case in the family.

2. The infecting organism was *Pseudomonas aeruginosa* which gained entrance to the milk supply through water which was dripping off of a rag into the pasteurized milk in one dairy. Bottles of dairies were exchanged without proper cleaning and sterilization, so that the organisms easily gained access to the other dairies.

3. The contaminated milk caused an epidemic of gastroenteritis in Great Bend and caused outbreaks among patients and employees of the hospital and in consumers of the Great Bend milk in outlying towns.

4. The infants were secondarily infected by mothers and nurses who drank the milk in the hospital, or by other members of the family after the infants had been dismissed from the hospital.

5. Apparently well persons who had ingested the contaminated milk acted as temporary carriers.

6. Of 24 infants studied clinically, it was possible to study 9 bacteriologically. *Pseudomonas aeruginosa* was isolated in the stools of all 9. Autopsy material was obtained from 2 cases for bacteriological study and *Pseudomonas aeruginosa* was isolated from both.

7. Epidemiological, milk sanitation, and bacteriological studies, all support this conclusion which is further supported by the therapeutic results of methylene blue.

8. The epidemic subsided within 3 weeks after control measures based upon the findings were put into effect.

American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 37 September, 1947 Number 9

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THE FORGOTTEN MIND

IT is an accepted truism that the health problems related to mental and emotional maladjustment are approximately equal in volume to all the other health problems which confront us. We know that the number of hospital beds occupied by advanced cases of mental and nervous disease nearly equals the number assigned to all other diseases and defects. We know that the burden placed on the average family by emotional maladjustments—fears, inhibitions, suspicions, insecurities, defense reactions of various sorts—are probably as heavy as those due to all types of so-called "physical" diseases in the home. We give lip service to these facts; but what do we do about them? How much serious thought have you, Dr. Health Officer, who read this editorial, really given to the problem in your community? Are you its Health Officer, or only its Physical Health Officer? Can you shrug your shoulders and leave the problem to the psychiatrists? How vital in your thinking, Miss Public Health Nurse, are the problems of mental hygiene which arise in your daily practice? What has the American Public Health Association contributed to this cause? How far does the attention devoted by this *Journal* to the subject of Mental Hygiene, reflect the real importance of the subject and how far is it bound by the inertia of past routine practice in the field of public health?

The U. S. Public Health Service and a few state health departments have stepped out and assumed real leadership; but most of us have failed to act on the assumption that this is really a basic and fundamental responsibility of our profession.

The passage on July 3, 1946, of the National Mental Health Act brings the issue clearly home to us. This law, it will be recalled, provides for erection and equipment of a research institute to be operated by the U. S. Public Health Service as a center for experimentation and specialization in this important field and for grants to outside research centers for the same purpose; for training of essential personnel in the mental hygiene field; and grants to aid in the establishment of mental health clinics for discovery, diagnosis, and treatment of persons with psychiatric disorders. The 80th Congress has provided an appropriation of approximately three millions for the first steps in carrying out the purposes of this Act.

If you feel that this matter does not concern you as public health workers, and as citizens, we recommend a serious perusal of the *Annual Report of the National Committee for Mental Hygiene* for 1946.[1]

Let us begin with the problem of institutional care, since historically this has always been our first community avenue of approach. The National Committee points out that about 1,000,000 persons in the United States are sufficiently disabled by mental illness to warrant hospitalization, but that only half that number receive such care. And what is the character of the care which the fortunate half million actually enjoy? Here are some pertinent points brought out by the National Committee in regard to state mental hospitals:

"(a) Some of our states spend as little as forty cents a day, all told, per patient;
(b) some state hospitals spend on food only seventeen cents a day per patient;
(c) many state mental hospitals are crowded to almost twice their capacity;
(d) mentally ill persons are often housed in buildings long since condemned because there is no money available for new structures."

Is it any wonder that the standards of the staffs of such hospitals tend to reflect the deplorable picture of neglect and mismanagement which these statements reveal? There are twenty times as many unfilled medical posts in our state hospitals as there are physicians willing to take such posts.

That conditions are not far different across our northern border is indicated by a recent article[2] which points out that in Canada, public mental hospitals are expected to provide board, lodging, clothing, and medical and nursing care for a budget of about one dollar per capita.

Now as to facilities for the outpatient service provided for child guidance and for the treatment of the adult who does not yet need institutional care. This is the most fundamental and most constructive part of our mental hygiene machinery. By clinic treatment, a certain proportion of cases otherwise headed for institutional care will be kept out of the state hospitals; but—what is much more important—thousands of persons are restored to happiness and efficiency who would never, perhaps, be sent to an institution but who would drag out their lives in wretchedness as a burden on family and community.

On this point the National Committee reports that there are 25 states in which not even one child guidance clinic is in existence; and that in the entire country there are less than 400 such clinics. The *Report* notes that only 50,000 boys and girls could get assistance from child guidance clinics in 1946, while over 250,000 teen-agers passed through our juvenile courts. The National Committee estimates the real need of the United States as 1,400 clinics; and points out that "if each outpatient clinic prevented the commitment either of one veteran with a service-connected disability or five civilians a year, more than the estimated cost of operating a clinic ($32,000 per year) would be saved."

Since Clifford Beers published *A Mind That Found Itself*, in 1908, we have made notable progress in our thinking about the problems of mental health; but our accomplishments in the field of concrete achievement are not much to boast about as the result of four decades. If the public health profession were really to put its shoulder to the wheel, thought might more rapidly be translated into action.

REFERENCES

1. National Committee for Mental Hygiene, 1790 Broadway, New York 19, N. Y.
2. Angus, L. R. *Canad. Pub. Health J.*, 38, 4:157 (Apr.), 1947.

PROGRESS IN THE USE OF FLUORINE FOR THE CONTROL OF DENTAL CARIES

WE have reviewed in an earlier editorial[1] some of the basic evidence presented by Bibby, Dean, and others in regard to the use of fluorine for the reduction of dental caries. More recent findings—along two different lines—warrant a discussion of the progress made during the past three years.

The simplest and most comprehensive method of applying this preventive is the addition of minute amounts of sodium fluoride (one p.p.m.) to a public water supply. One report on this subject has come from Connecticut. Erlenbach and Tracy[2] compared 187 children in an institution where fluorine was added to the water supply with 149 children in another institution used as a control. After a one year experimental period, the "caries attack rate" was 3.0 per cent and 4.3 per cent in the respective groups, a 30 per cent lower incidence of new carious teeth in the group receiving fluorine. The children in the fluorine series were older, however, on the average and had a high incidence of caries at the outset of the experiment. The difference in new carious teeth may well have been due merely to the fact that the experimental group had already progressed farther along the road of the normal development of caries with age, or as a result of some other physiological variable between the groups.

This is a most important point. Klein,[3] in a study of children of Japanese ancestry, reported that at ages between 8 and 10, a group of children supplied with fluorinated water showed (in 2 years) 13 per cent of new decayed or filled teeth against 31 per cent for a control group; while for children between 11 and 14 years, the respective ratios were 11 per cent and 15 per cent. It seems probable that the effect of fluorinated water is most significant in early years. We must await the results of extensive studies now under way at Grand Rapids, Mich., and Newburgh, N. Y., for a more complete answer to this question.

A second method of applying fluorine is that of "topical application." This consists in giving the teeth a thorough prophylaxis, isolating the teeth to be treated by cotton rolls, drying the teeth thoroughly, painting their dried surfaces with 2 per cent sodium fluoride, and allowing the painted surfaces to dry. A carefully controlled series of experiments with this procedure has been reported by Knutson and Armstrong,[4] in which age and physiological variables were ingeniously controlled by treating only teeth in one upper and one lower quadrant of the mouth. The treatments were applied in 7 to 15 topical applications (to those quadrants) during a period of 8 weeks in the spring of 1942—and 242 subjects have been under observation for 3 years. Results in the upper and lower quadrants were quite consistent and the following general results were obtained for the treated quadrants.

Year	*Per cent Less Newly Carious Teeth*	*Per cent Less Newly Carious Surfaces of Previously Carious Teeth*
1942–1943	40	12
1943–1944	47	25
1944–1945	22	33

Whether the decreased improvement in newly carious teeth and the increased improvement in new areas on previously carious teeth is significant is uncertain. With the passage of time, the number of non-carious teeth available to become carious must, of course, decrease. In general, however, the results are encouraging.

It appears that thorough and repeated topical application of fluorine reduces the development of caries by 30-40 per cent; and that the influence of this treatment persists for at least 3 years.

Jordan and Knutson and their associates[5] have recently reported detailed studies of the effect of varying the number of topical applications and of omitting prophylactic treatment prior to application. The per cent reduction in caries incidence recorded was as follows:

	Treatments				
	1	*2*	*3*	*4*	*6*
Jordan, with prophylaxis	5	10	21	..	..
Knutson, without prophylaxis	..	9	..	20	21

Knutson concludes that the preliminary prophylaxis should be an essential part of the procedure.

Fulton and Tracy have suggested that it might be preferable to make the topical application once every 6 months instead of 7 to 15 times within a short period as was the practice of Knutson. They report a one year experiment on this procedure and compare the results with those of Knutson's first year for two selected age periods, with respect to reduction in caries incidence:

	Age	
Knutson	7–10	47
Fulton	5–10	52
Knutson	11–15	60
Fulton	11–14	53

The question as to the number and spacing of topical applications must be determined by further studies. It seems reasonably clear, however, that topical application is a highly effective procedure; that it should be preceded by a thorough prophylaxis; and that—whatever may be the case with the consumption of fluorinated water—this process is effective with older children.

There is still a third method of applying fluorine, intermediate between its addition to drinking water and its intensive topical application. This is the use of a fluoride mouth wash as a part of the daily tooth toilet. Individuals have claimed highly satisfactory results from this procedure in their families, but we know of no statistical study which has scientific validity in this field. It is still uncertain whether fluorine in a water supply exerts its influence directly on the teeth or through absorption and circulation of the salt to the teeth indirectly. If the latter process is involved it would explain the fact that major effects in this case are produced on the young child. On the other hand, topical application must apparently operate directly on the tooth through its surfaces and this is in accord with its efficacy in older children. It is not easy to see how the use of a mouth wash could produce results anything like as efficient as topical application; and the latter would seem to be, at present, the method of choice. We trust that the dental profession will work out the best procedure as promptly as possible; and we recommend to health administrators and health educators consideration of the inclusion of this procedure in their programs.

It should be noted that the Divisions of Dental Health of Massachusetts and Connecticut and other states are strongly advocating topical application of fluorides. "On March 15, 1947, the American Dental Association published a report in the American Dental Association *Journal* stating, 'The demonstrated relation between the presence of fluorides in domestic water supplies and the

prevalence of dental caries in children has led directly to experimental studies on the effect of the topical applications of various fluorides to teeth. These studies, although not uniform in methods of findings have demonstrated the effectiveness of topically applied fluoride solutions in reducing the incidence of dental caries in children under certain conditions. Considerable research still remains to be done in determining the optimum frequency and method of such applications, but the use of topically applied fluorides by the dentist can now be recommended as a general preventive measure.'"

The number of dentists, even in the United States, is about half the number necessary to care for the present incidence of dental decay, and the ratio of dentists to population has remained between 50 and 60 per 100,000 population since 1920; there were 25 per cent less dental graduates between 1930 and 1940 than in the previous decade. Only a reduction of some 40 per cent in incidence of dental caries could bring this situation into balance; and such a reduction seems a possibility if topical application of fluorine becomes general. The treatment could be organized under public health dentists so that dental hygienists in a clinic would provide treatments at a minimal cost. This may well become an important factor in the public health program of the future.

REFERENCES

1. Editorial. *A.J.P.H.*, 34:528 (May), 1944.
2. Erlenbach, F. M., and Tracy, E. T. Control of Dental Caries by Artificial Fluorination of a Water Supply. *Connecticut Health Bull.*, 60:203 (Sept.), 1946.
3. Klein, H. Dental Caries Experience in Relocated Children Exposed to Water Containing Fluorine. *Pub. Health Rep.*, 60:1462 (Dec. 7), 1945.
4. Knutson, J. W., and Armstrong, W. D. The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience III. Report of Findings for the Third Study Year. *Pub. Health Rep.*, 61:1863 (Nov. 22), 1946.
5. Jordan, W. A., Wood, O. B., Allison, J. A., and Irwin, V. D. The Effects of Various Numbers of Topical Applications of Sodium Fluoride. *J. Am. Dent. A.*, 33:1385 (Nov. 1), 1946.

MYSTERIES OF MEAT INSPECTION

DID you know that you can determine whether a lobster was dead when it was boiled by bending its tail back straight and seeing whether it snaps back into place or not? At what point of said lobster's anatomy should you sniff to determine whether his tissues have become decomposed?

Did you know that you should examine the side of a mackerel, the backbone of a halibut, the eyes of a cod, to determine its degree of mortuary decomposition?

Did you realize that pressure due to forcing meat through a chopping machine too fast, or the chopping of pieces that were too large, or the piling up of meat on a counter during trimming, could produce appreciable increases in temperature, favorable to decomposition? Would you have imagined that a tactful campaign of education could reduce the average bacterial content of chopped meats in a city from 10 million to 200,000 per gram?

The Editor did not know any of these things until he talked recently with the Inspector of Meat and Provisions in a New England city.[1] He came away from the conference with a new reverence for the occult arts of the meat inspector.

REFERENCE

1. Joseph Morin, Springfield, Mass., Department of Health.

Clearing House on Public Health Salary Information

THE following caution is suggested for readers: in any recommendations for salaries for various public health personnel made by the Executive Board of the Association or by its Sections or committees, or by other agencies such as the public health nursing salaries recommended by the National Organization for Public Health Nursing in the June Clearing House, it is understood that, because of the cost of living or prevailing salary levels in other professions in any particular community, the recommended salaries may not be high enough. It is a truism that no single average or median figure of any kind will be applicable to the entire United States.

Increased Salaries for Entering Positions in New York State

One of the early announcements to come out of the New York State Health Department following the appointment of the new Health Commissioner, Herman E. Hilleboe, M.D., was of higher salaries to physicians qualifying for the entering position of either Assistant District Health Officer or Senior Public Health Physician.

In announcing these increases, Dr. Hilleboe said:

"We fully realize that even with the recent increases in the salary scale, the pay the department can offer well trained physicians is still not as much as we would like and considerably less than such physicians can make in private practice, but it should attract those physicians who are more interested in helping to prevent unnecessary human suffering than in treating illness which has occurred. The increases granted will partially compensate these physicians for the increased cost of living, and help to meet the competition of local and federal agencies, such as the Veterans' Administration."

What Kind of Employers Are We?

The June *Bulletin* of the National Tuberculosis Association in "What Kind of Employers Are We?," by Edward Funkhouser, raises some questions that might well be pondered as a part of the salary problem, which is after all one aspect of the larger problem, that of securing and holding personnel. The questions raised are:

1. Is there a fair salary policy—fair both in relation to other employees of the agency and to going rates for community jobs of comparable responsibility?
2. Is fair personal treatment for the individual assured through a clear statement of policy as to salary, working conditions, vacations and sick leave, as well as a method of dealing with grievances?
3. Are opportunities for advancement provided and are employees aware of these opportunities and encouraged to prepare themselves to meet them?
4. What are working conditions? Mr. Funkhouser points out, for example, that among tuberculosis associations there is a wide gap between the number of employees enrolled in a retirement plan and the total number of workers. He suggests other security routines such as preëmployment, physical examinations, and routine check-ups. He also suggests the value of good tools and good supervision.

Index Numbers of Income and Cost of Living

The Clearing House has received the following figures on the relative rise in the cost of living, in the incomes of private physicians, public health physicians, and nurses and in the wages of

INDEX NUMBERS OF INCOME AND COST OF LIVING

For Public Health Physicians and Nurses, Physicians in Private Practice, and Industrial Workers

	Date	*Index Number*
Consumers Price Index (Cost of Living)	Feb., 1947	152.8 [1]
Average Weekly Earnings of Workers in all Manufacturing Industries	Jan., 1947	197 [2]
Average Net Income of Physicians Practising as Specialists	1943	191 [3]
Average Income of Public Health Nurses	Jan., 1947	130 [4]
Average Income of Public Health Physicians	Mar., 1946	127 [5]

1. *The Handbook of Basic Economic Statistics*, 1947 Edition with supplements. Government Statistics Bureau of Washington, D. C. 631 Pennsylvania Ave., Washington. D. C. March Supplement, p. 13.
2. *Ibid.* p. 30 of 1947 Edition; p. 6 of March Supplement.
   1939—Average weekly earnings $23.86
   Jan., 1947: Average weekly earnings $46.94.
3. 1939 level $6,184—The incomes of specialists. *Medical Economics*, 18:47–51, Sept., 1941.
   1943 level $11,808—Specialists' economic status. *Medical Economics*, 23:50–54, Oct., 1945.
4. 1938 level $1,484—Borowski, A. J. Positions and Rates of Pay in Public Health Agencies. *A.J.P.H.*, 28:1197–1202, Oct., 1938.
   1947 level $1,928—Heisler, Anne (U.S.P.H.S.). Communication dated Mar. 19, 1947. Average salary for vacancies as public health nurse and junior public health nurse in all types of agencies as of Jan. 1, 1947.
5. 1938 level $4,214—Borowski, A. S. Positions and Rates of Pay in Public Health Agencies. *A.J.P.H.*, 28:1197–1202, Oct., 1938.
   1946 level $4,750—Palmer, Geo. T. Some Problems in the Training of Personnel. *California's Health*, 4:142–144, Mar. 31, 1947.

workers in manufacturing industries, with the notation that they are of interest to the current discussion.

We agree that they are interesting and that they advance our thesis that public health salaries are too low. We wish to point out, however, qualifications that should be borne in mind in drawing conclusions from them.

In the first place, the nature of index numbers must be remembered—that they are not absolute and cannot be related absolutely to each other. They rather represent the distance that each factor has traveled from its respective base line. They do not mean that wages of workers in manufacturing industries are higher than public health salaries; they mean only that manufacturing wages increased faster than public health salaries.

A second factor that must be remembered is that not all starting dates are the same. The later date for salaries of public health physicians is a year earlier than in the other categories. In that year, the general level of salaries of public health physicians undoubtedly increased, thus raising the index that is comparable with the other groups to a figure beyond 127.

LOCAL AND STATE HEALTH PROGRAMS CURTAILED BY REDUCED APPROPRIATIONS IN WASHINGTON STATE

The following article from Washington State's *Health Commentator* for May, 1947, suggests the presence of still another threat to the current campaign to get public health salaries on a level that will attract well qualified persons. Perhaps another area of education needs to make clear the distinction between real and "Taberized" economy.

"Local health departments throughout the state, faced with a 50 per cent cut in state subsidy funds, are either seeking additional money locally or have

trimmed their staffs and are putting away plans for bettering health services.

"The funds available for state aid to local departments were slashed from $264,226.50 for the 1945–1947 biennium to $125,000 for the 1947–1949 biennium.

"Elimination of this aid has made it necessary for 49 positions to be either dropped from the payrolls or paid for by local sources. Some of these positions are unfilled vacancies on the staffs, due to the shortage of trained health workers; others represent trained public health workers who have been released from their jobs.

"The 49 vacated positions include 32 public health nurses, 6 clerks, 7 sanitarians, 2 bacteriologists, 1 health educator, and 1 dental hygienist.

"In addition to personnel cuts, plans for improving local health services, such as developing full-time departments in place of inadequate part-time units, are being shelved. Only 22 counties are now receiving full-time health services, and plans for full-time departments in Whatcom and Grays Harbor counties are being postponed unless money can be raised locally.

"Salary funds for the State Health Department were cut from $675,358 to $564,000, although the requested budget was more than twice this amount. This cut necessitated dropping 22 positions from the state staff, as well as tabling plans for expansion in many important fields such as mental hygiene, sanitation, health education, and industrial hygiene.

"The State Health Department's operations budget was increased $38,270, but this was largely consumed by an increase of $36,275 in Smith Tower rent rates. Allowing for increased costs of materials and supplies, substantial cuts will also be required in this field.

"Positions dropped from the state staff include 3 physicians, 10 clerical workers, 2 consultant nurses, 1 health educator, 2 statistical workers, 1 venereal disease investigator, and 2 sanitarians. All employees of the department are hired under rigid State Merit System specifications, and personnel practices are entirely removed from partisan politics.

"Services for crippled children also are being curtailed, as the appropriations for this work were reduced from $239,495 to $180,400 for the next two years. Due to increased costs of hospitalization and the reduced budget, fewer children needing help can be accommodated during the next two years."

WHAT THE READERS SAY

Apropos of the article in Washington's *Health Commentator* are two communications from that state.

Arthur L. Ringle, M.D., State Health Officer writes:

The Washington State Legislature does not appropriate individual salary items for health department workers, but appropriates a lump sum for "salaries and wages." The cost of living bonus passed by the Legislature in 1945 was incorporated in the Compensation Plan as an integral part of the salary ranges. We feel that our salary ranges are inadequate to attract and retain qualified personnel in our health organization. This opinion is substantiated by a rather complete salary survey which was recently made by the Washington State Personnel Board.

Our Merit System Rule does permit us to employ persons with training and experience above the minimum requirements at a rate above the entrance rate. We have been forced to resort to this procedure in attracting experienced personnel, although we feel that such action is not entirely in conformity with the true spirit of a merit system.

Emil E. Palmquist, M.D., Seattle Health Officer writes:

It is with great interest that I have read the editorials appearing in the May and June issues of the *Journal* relative to salaries being paid public health professional personnel. It is most timely to bring this to the attention of public health administrators. I only wish that public officials who hold the purse strings would be more cognizant of the need for raising salaries. I have used some

of the material from your editorials to stimulate local officials into providing better salaries, especially for physicians of the department. The salaries for public health nurses, sanitarians, and public health engineers, are fairly well up but so far I do not have the physicians' salaries in a good position. At present the physicians' salaries in this department, other than my own, are $6,180 and $6,300 annually. Transportation is furnished by means of the City providing an automobile for their use in connection with their work.

I am still looking for an Epidemiologist to head the Division of Acute Communicable Disease Control. The salary for the position is now $6,180 plus transportation. There is a possibility that this position might also carry an appointment in the new University of Washington Medical School. I am asking the City Council to establish a salary range for these physician-division directors of $7,200, $7,800 and $8,400. They must have specialized training in public health plus training in their particular specialty. The other three positions of this rank are now filled by well qualified public health men, namely, Director, Division of Maternal and Child Health Services, Director, Division of Venereal Disease Control, and Director, Division of Tuberculosis Control.

I am wondering if you can give me any assistance in finding a qualified Epidemiologist. I would prefer to have a younger man who has one year of postgraduate training in public health with specialization in communicable disease control or epidemiology. Experience is desirable but not required.

From about the middle of December until the middle of May, I had an Epidemiologist of good training and qualifications lined up to take the vacant position. He was still in the Army and I expected his release momentarily. About the time his release was due, he accepted another position at an annual salary of $8,100 in the Civil Aeronautics Administration. This was quite a shock to me since I had been counting on him to come for the $6,180 annual salary. I have related this experience to the officials in charge of the purse strings locally, but will not know for another two or three months whether I have made sufficient impression to get any substantial increases for next year. To say the least, I am somewhat discouraged about salaries for physicians in public health, and the prospects for the future do not seem to be too good.

You might be interested to know that Dr. John Fouts, the King County Health Officer, resigned effective July 1, 1947. We are now attempting to effect a consolidation of the City and County Health Departments for this community; namely, the City of Seattle and King County. I do not know yet what the outcome will be but the idea has the blessing of the Medical Society and also of the Seattle Municipal League. I shall let you know when I have any definite information.

EDITOR'S NOTE: The last paragraph is included here advisedly to remind readers that city-county consolidations are closely related to the salary and personnel shortage situations.

V. L. Ellicott, M.D., County Health Officer of Montgomery County, Maryland, writes as follows:

The Health Department of Montgomery County, Maryland, now employs twenty public health nurses. On July 1, 1947, the following salary scale went into effect:

Junior Public Health Nurse (11 positions)	$2,400
Senior Public Health Nurse (3 positions)	$2,600
Assistant Supervising Nurse (2 positions)	$2,800
Supervising Nurse (3 positions)	$3,200
Director (1 position)	$3,600

All positions carry three increments of 5 per cent each, which are given at 6, 18, and 30 months respectively, after appointment.

The position of Junior Public Health Nurse does not require university study. The position of Senior Public Health Nurse requires at least 14 and preferably 28 credits (one year of Public Health Nursing). Several of the supervising positions carry administrative responsibilities beyond those of nursing supervision. This accounts for the relatively high ratio of supervisors to staff nurses.

The new salary scale represents an increase of approximately $500 over the old scale. The principal reasons for the increases were:

(a) Higher salaries are being paid to public health nurses by other agencies in the metropolitan area of Washington.

(b) The former salaries were little higher than clerical salaries and therefore offered little inducement to high school graduates to spend three years in training.

(c) Teachers' salaries have been markedly increased. Nurses' salaries should be approximately equal to those of teachers because the period of training is approximately the same.

The Civil Service status of public health nurses has been changed from subprofessional to professional.

J. Lynn Mahaffey, M.D., Director, New Jersey State Department of Health, writes:

The salaries paid to employees of this department are in accordance with ranges established by the State Civil Service Commission. A system of yearly increments is in force. The compensation plan at present applying was established in December, 1944.

Physicians: A well qualified and experienced industrial physician in the Division of Adult and Industrial Health left the employ of this Division because of inadequate salary. He was receiving $4,500 per annum and was offered $7,500 in the same field with a large insurance carrier.

Nurses: The Chief of the Department's Division of Maternal and Child Health reports increasing difficulty in the past several months in securing nurses to fill positions in the field of maternal and child health. The salary established for the position of Public Health Nurse in this state is $1,800 per annum. While nurses have accepted positions at this salary, they soon leave. At least four have left to take full-time school positions starting at $3,100 a year; several have accepted institutional positions at $2,400 a year. Two nurses are considering positions in other states; one was offered $2,850 and the other $3,000. In other instances nurses interested and about to accept a position with the division, refuse to work for the $1,800 salary as they can receive better income in institutional, industrial, or other branches of nursing.

Engineers and other employees of the Bureau of Engineering and Sanitation: Resignations among engineering personnel in recent months number four: three started at $1,800 with a range up to $2,280 as hydrobiologist or watershed inspector in 1931, 1939, and 1940, respectively. Their rank was changed to assistant sanitary engineer with a salary range of $2,400 to $3,000. In 1944 each was raised to the rank of sanitary engineer with a salary ceiling of $3,600. Each left in 1946 for more lucrative pay. An additional engineer at the same pay left for the same reason after seven years as assistant sanitary engineer at $1,800 to $2,280 and two years as sanitary engineer at $3,000 to $3,600. A fifth who was certified by Civil Service did not accept the position of sanitary engineer at $3,000–$3,600, and a sixth, that of junior sanitary engineer, at $2,040–$2,640 because of the low salary range.

Laboratory Personnel: Two Junior Laboratory Technicians have left the Bureau of Bacteriology because of salary limitations, and there is general dissatisfaction with salaries among technical employees in the Bureau.

X-Ray Technicians: The entrance salary of $1,680 per annum is insufficient to attract competent technical personnel for the Division of Tuberculosis Control. As a result, it is necessary to employ untrained and unqualified persons. After persons are trained, they are offered salaries double the amount paid by the state, and resignation ensues.

Pharmacologist: The Bureau of Food and Drugs recently lost a particularly well qualified pharmacologist because, upon his return from military service, he secured a position with a drug manufacturing firm at an entering salary of $5,500 per year, as contrasted with the $3,000 salary in the department. No other satisfactory candidate has been secured because of the low salary.

Veterinarians; Food Inspectors: Two veterinarians employed in milk control work and two food and drug inspectors have also been lost because of insufficient salary.

Health Education Workers: In the original plan of work for the Division of Health Education there was contemplated the employment of a person who would be trained in still photography to take still pictures as needed for exhibits, news releases, lantern slides, and other uses in health education activities. The salary set by the State Civil Service Commission was $1,800, which none of five well qualified applicants would consider. The individual who finally accepted the position proved unsatisfactory and was dismissed. Another accepted the position; while his service along certain lines was satisfactory, he was not capable of doing good photographic work. He subsequently left for a better paying position.

Multilith operators receive an entering salary in state service of $1,440, which has proved inadequate for securing and retaining qualified persons.

The administrative and technical staff of the Division of Health Education report offers of positions in other agencies and in commercial organizations at better salaries. It is feared that economic pressure may eventually bring about the loss of these employees.

Credit Lines

NEW HOME FOR LOS ANGELES HEALTH DEPARTMENT

George M. Uhl, M.D., and David Janison, Health Officer and Director of Health Education respectively of the Los Angeles City Health Department, have prepared this story of how citizens of that city were persuaded to vote a $6,500,000 bond issue to finance construction of new public health facilities:

On May 27, 1947, the voters of Los Angeles approved a $6,500,000 municipal bond issue to finance the construction of new public health facilities. It was the first time in the city's 156 year history that the health department was granted an adequate and suitably constructed home of its own. From the time of its creation, the health department has been alternately housed—clinics, laboratory, and all—in a succession of outmoded structures no other governmental agency would have. Two address changes in past years were entirely accidental. The first came when the telephone company delivered an ultimatum to the city to provide rainproof offices for the health department or lose its telephone equipment. So the health department was told to close up its umbrellas and cram itself into one of the oldest buildings in the city, which workmen soon after came around to tear down for the new city hall. Again the health department was moved, this time to a ten story bank-and-office building as a "temporary measure." Twenty-one years later, when the voters approved the $6,500,000 bond issue, the department was still in its "temporary quarters."

The passage of the bond issue marked a turning point in Los Angeles's public health history. How the city administration successfully convinced the bond-shy voters of Los Angeles that the issue was essential, is a story of extremely close coöperation between all the city departments, the press, radio, and civic groups, and of a strenuous effort on the part of city employees themselves.

Decision for a Bond Issue—Much of the post-war planning for expansion of municipal services, including public health, fire and police protection, combustible rubbish incinerators, playgrounds, and sewer improvements, were worked out by the heads of city departments, the City Council, and the Mayor. Altogether, $55,500,000 was estimated as necessary for the expansion, and bond issues for the separate items were decided upon.

The Campaign—Six propositions, covering each of the municipal functions to be expanded by bond issues, were placed on the ballot. A citizens' committee was formed to promote all the issues. Each city department urged support of all propositions, but gave special emphasis to its own bond issue. The citizens' committee was late in getting started, primarily because of the difficulty of raising funds. Finally, the committee succeeded in raising enough money to begin placing billboards, radio spot announcements, small newspaper advertisements and news publicity.

Nearly 2 months before the elections, a delegation composed of the Mayor, the Fire Chief, Police Chief, City Engineer, and Health Officer, visited newspaper editors, radio managers, labor organizations, and representatives of the motion picture industry to elicit support. As a result, the newspapers took an active part in the campaign, and the motion picture industry produced a 4 minute trailer which was exhibited in more than 200 movie theaters for 10 days preceding the election. Radio stations devoted a considerable part of their broadcast time to special spot announcements, dramatizations, and eye-witness reports of the city's limitations. Service clubs held special programs. Hundreds of thousands of pieces of literature, none printed at city expense, were distributed. The slogan on all centrally distributed literature and material was, "Vote Yes on Propositions A through G." Although receiving all this extra mention, Proposition G, which was to have financed the expansion of branch city halls, was defeated even in those districts which it was to benefit. Significantly enough, it was the only proposition which had no additional "educational" support and it was the only proposition defeated.

The health department, on the other hand, through the off-hours contribution of its employees and executives, gave its Proposition F all the "educational" support it could muster. It drew up a graphic handbill, with photographs of an old-time Wild West type of structure contrasted with the city's only modern district health center. Citizens were shocked to learn that both structures were serving the same purpose, and that in the Wild West building a nurse had recently fallen through the floor. Posters were drawn up, support by various organizations was enlisted, talks by the dozen were given, and leaflets

were distributed wherever crowds could be found, in front of public buildings and sports stadia. Thousands of personal post cards were mailed to friends by employees. Newspapers were given every "assistance" possible in their coverage of the department's antiquated facilities, including pictures of the health officer and his secretary lighting up the gas fixtures in his office, which were still intact although modified for use of electricity, and crews trapping rats elsewhere in the building. A running supply of stories pointing up the need was prepared and gradually released to the more than 100 newspapers circulating in the city. Still photographs were prepared for inclusion in the movie trailer. In the words of newspapermen and radio executives, the health department "got more than its share" of publicity.

The Results—Bond issues require a two-thirds majority of votes to be passed, so that opponents can defeat them with a 33.3 percent "No" vote. Because enough "educators" could not be mustered, the proponents decided to let Proposition G coast along on its mention in the campaign slogan. On election night, the earliest returns showed "G" trailing, while the public health proposition, together with fire, police, incinerators, playgrounds, and sewers came through comfortably, and continued to do so until all votes were in. The final count on health bonds was 203,112 for, 88,917 against.

Los Angeles, in the not too distant future, will have a new central headquarters and 6 new district offices for its health department. The voters, having seen how handicapped the department was, felt it would be worth $6,500,000 plus interest for 20 years to modernize its facilities. And when the city itself begins to realize the benefits of this expenditure, it can thank its health department employees, who gave their own time and money to broadcast the need.

WHAT DO WE KNOW ABOUT REHABILITATION?

The field of rehabilitation and services to the handicapped assumed increasing importance in the period between the two world wars. New governmental and voluntary agencies concerned with rehabilitation sprang up and many already existing health and welfare agencies included rehabilitation activities in their programs. This trend has been greatly accelerated during World War II and the post-war period, due both to the programs of the armed services and Veterans' Administration and to the effort made by industry to overcome the man power shortage by employing handicapped workers.

Public health workers have become increasingly aware of the importance of rehabilitation in relation to the public health field. Knowledge of the agencies concerned with rehabilitation and services to the handicapped constitutes an essential tool for public health workers; yet the number of health and welfare, educational, and other agencies engaged in some form of rehabilitation activities has made it increasingly difficult to keep well informed.

In appreciation of this difficulty presenting itself to workers in component activities, Dr. Howard Rusk and Eugene J. Taylor have compiled *A Directory of Agencies and Organizations Concerned with Rehabilitation and Services to the Handicapped* (published as a public service by the *New York Times*, price 10¢). The *Directory* lists national organizations and agencies as well as some local agencies. The listings include the name, address, and the name of the executive officer of the organizations as well as a description of the structure, membership, source of funds, program, scope of activities, and publications.

The 133 page booklet will be a valuable addition to health department libraries and many public health workers will wish to keep it on their desks for convenient and frequent reference.

SOCIAL SCIENCE RESEARCH COUNCIL "ITEMS"

With the March, 1947 issue, *Items* of the Social Science Research Council began publication as a quarterly, or oftener if it fills a need. It is intended to be a report of current activities of the Council and grows out of a conviction that there is urgent need for clearer understanding of the role of the social

sciences on the part of the public. Address Social Science Research Council, 270 Park Avenue, New York 17, for information about subscription rates.

HISTORY OF TUBERCULOSIS CONTINUED

The American Sanatorium Association: A Brief Historical Sketch is the third in the historical series by which the National Tuberculosis Association hopes to get into a permanent record the story of the men and movements by which tuberculosis has been brought under control. Written by Lewis J. Moorman, M.D., who has been Director of the Oklahoma Cottage Sanatorium since 1914, and was President of the National Tuberculosis Association in 1933–34, it is the story of Dr. Trudeau and the forces he set in motion which have led to present-day tuberculosis sanatorium practices. Available from state and local tuberculosis associations at $1 a copy.

RECONSTRUCTION TOWARD EUROPEAN HEALTH

While the brass hats thunder and the power politicians scramble for temporary advantage, various auxiliary organizations of the United Nations go ahead with the fundamental but often undramatic tasks of building a healthy world which alone can serve as a prelude to a peaceful world.

The latest evidence of such a task comes in the notice of an FAO mission to Poland during July and August to survey the country's major agricultural problem, with particular reference to the nutritional level of the population.

The members of the mission are:

Chairman—Noble Clark, Director of the Agricultural Experiment Station, University of Wisconsin

Nutrition and food management—Dr. M. J. L. Dols, Professor of Nutrition, University of Amsterdam

Crop husbandry and marketing—T. J. Harrison, Assistant Commissioner, Canadian Board of Grain Commissioners

Live stock husbandry and marketing—Professor James Morrison, Queens University, Belfast, and Professor Aksel Milthers, Royal Veterinary and Agricultural College, Denmark

Marketing and preservation of perishable products—Paul Findler, U. S. Department of Agriculture

Preservation of trees—E. N. Munns, U. S. Forest Service

Agricultural economist—Dr. Mordecai Ezekiel, Head of the Agricultural-Industrial Branch of the FAO Marketing and Economics Division

Secretary and rapporteur—Dr. A. B. Lewis, FAO Agriculture Division

THE CASE FOR A FEDERAL DEPARTMENT OF HEALTH, EDUCATION AND SECURITY

Late in 1946, the American Council on Education and the National Social Welfare Assembly jointly sponsored a Committee to study the question as to whether an executive Department of Health, Education and Security, with a cabinet officer at its head, was in the public interest, and to determine what basic principles should be incorporated if such a department were desirable.

The report of this committee was recently published. It gives an excellent summary of the arguments for and against the creation of such a department and outlines the basic principles of legislation creating it. This report should be very useful as background for decisions as to whether to support such legislation in the next session of Congress.

Address, National Social Welfare Association, 1790 Broadway, New York 19.

PUBLIC WELFARE'S STAKE IN REORGANIZING LOCAL GOVERNMENT

Public Welfare, the monthly journal of the American Public Welfare Association, in June, 1947, published an article, "Health and Welfare's Common Concern with the Multiplicity of Local Government." Written by Martha Luginbuhl, Research Assistant of the APHA's Subcommittee on Local Health

Units, this points out that effective administration of public welfare, no less than of public health, requires a broader base than the town or village. *Public Welfare* is to be congratulated on recognizing the urgency of this problem and on giving space to a discussion of the county or the multi-county district as a unit of health and welfare administration.

"BETTER HEALTH" MAKES ITS DEBUT

In December, the North Carolina Social Hygiene Society which had just been chartered under state law, began the publication of *Better Health,* an ambitious bi-monthly journal. It is a part of "the current popular and official movement for the building of hospitals and health centers in the state," which is also reflected in the Good Health Association and the Commission on Medical Care of the state. Nor is this movement confined to professionals —Kay Kyser has lent his name and his talents to make North Carolina health conscious.

MINNESOTA DISCUSSES LOCAL PUBLIC HEALTH SERVICES

The University of Minnesota Center for Continuation Study recently held a two day Continuation Course in Community Activities for Public Health Services.

There were three main panel discussions; one each on the importance of local health services, how to keep our public health nursing programs going, and how we can improve school health. On the panel for the first mentioned were a local health officer, a state district engineer, a county nurse, a local health educator, a representative each of the Minnesota Council of Social Agencies and the Minnesota State Medical Association, and the Secretary of the State Committee on Local Health Services.

This is an interesting illustration of the several interests that must be brought together in developing community planning for local health services.

SEEING AN OVERWORKED HEART IN ACTION

The Chicago Heart Association combined health education and a plea for funds in a unique demonstration at a recent luncheon meeting with 85 business executives in the Chicago area. Four hearts were displayed in a bottle: one a normal heart; one a heart about twice normal size belonging to a newspaper executive who had a stroke while arguing with an assistant; a third of a department store executive who would not follow doctor's orders to slow down, and whose distorted heart was puffed like a toy balloon; and the last of a man who had had a heart attack at 65, followed his doctor's orders to relax and died in his sleep at 80.

Louis N. Katz, M.D., Director of cardio-vascular research at Michael Reese Hospital, in presenting the demonstration, declared that one out of every two of the nation's professional men and executives die of high blood pressure or hardening of the arteries. The President of the Association, G. K. Fenn, M.D., asked for $100,000 for research, saying, "It's a doctor bill, submitted in advance for the doctor bills that would be much larger and that we hope you never will have to pay."

MIGRANT LABOR

The Federal Interagency Committee on Migrant Labor, established in 1946, under authority of the Federal War Mobilization and Reconversion Act, has just made its report which it calls *Migrant Labor—a Human Problem.* It reports varying estimates of from one to five million agricultural and industrial migrants. These "forgotten people of 1947" are "unorganized, unprotected by workmen's compensation laws, ineligible for educational, health, or

welfare benefits . . . and frequently find maintenance of even a minimum standard of living an impossibility." But they are, nevertheless, basic to the nation's agricultural economy.

The committee makes a series of recommendations. Among them are safe transportation ("occupational accident and death rates are probably the highest for any major industry"), establishment of minimum wages, extension of workmen's compensation laws to migrant workers, compulsory school attendance for children, regulation of private employment agencies, and continuance and extension, as required, of the federally sponsored labor camps that have been a part of the national scene for a decade and that will be remembered as the grateful haven of the long-suffering Joads. It is a report that stresses human values but its 9 appendixes are a thorough documentation as well. Available from the U. S. Department of Labor, Washington, D. C.

THE FIRST FIVE YEARS OF THE NUTRITION FOUNDATION

The Nutrition Foundation recently issued a report of the first five years of its work. Wholly supported by the food industry, it has appropriated more than a million and a half dollars in the five years. Sixty per cent of this sum was for basic research studies. Research grants have been made to 54 colleges, universities, and research institutes in the United States and Canada and have covered wide areas of nutrition problems. Nine per cent of appropriations were made for education and professional training.

The full report, *Research and the Science of Nutrition*, is available from the Nutrition Foundation, Chrysler Building, New York 17.

SEEING THE SIGHTLESS

The visual arts are heavily drawn upon in the 41st annual report of the New York Association for the Blind called, *Their Future Is in Your Hands*. Not only is it an annual financial and activity report of this million dollar operation but even more it is a plea for treating the blind like human beings. The Department of Public Relations, which prepared the report, also develops exhibits, radio programs, news interviews to help the sighted in understanding the blind. It also manages the Lighthouse Players, a group of talented blind actresses whose public performances convince audiences that blindness is no deterrent to high adventure and courageous living. The Director of the Association, Philip S. Platt, Ph.D., and the Director of Public Relations, Louise S. Kintner, are to be congratulated on the report—its excellent pictography, photography, typography, and paper and the humanity of its approach.

"HEALTH RESOURCES" APPEARS

Volume 1, Number 1 (February, 1947) of *Health Resources* has arrived from the Marion County (Salem, Ore.) Department of Health. Due to the shortage of mimeograph paper, it is done on heavy green cover paper. It is a very simple but effective attempt to tell the Marion County public what services are available through its Health Department. It is another illustration of what can be done with simple tools and a little imagination and ingenuity.

ANTHRACITE DUST PROBLEM STUDY PUBLISHED

Adequate ventilation and the liberal use of water sprays are the 2 most effective ways to control coal dust hazards in anthracite mines and to protect workers from the respiratory disease known as anthracosilicosis, according to a 3 year wartime survey made by the Bureau of Mines in 38 collieries in the Pennsylvania anthracite region, recently published. The publication was pre-

pared by Leland H. Johnson, Bureau Mining Engineer with the Health and Safety Branch, Wilkes-Barre, Pa. It also covers routine dust sampling and analyzing, use of a wet-type pneumatic drilling machine, removal of dust from roadways, and the use of water in fighting mine fires and removing harmful gases from blasting.

Copies of Technical Paper 704, *Dust Problems in the Mines of the Pennsylvania Anthracite Region,* can be obtained *only* from the Superintendent of Documents, Gov. Ptg. Office, Washington 25, D.C., at 15 cents each.

UNESCO NEWS

On June 15, Vol. 1, No. 1 of *National Commission News* was published. It is the monthly organ of the U. S. National Commission for UNESCO (United Nations Educational and Social Council). It is a useful 8 page pamphlet for keeping informed of one of the United Nation's special commissions. The first issue gives a brief outline of the UNESCO program.

The Director General of UNESCO is Dr. Julian Huxley of the United Kingdom; the American member of the board is Milton Eisenhower, President of Kansas State College, and Chairman of the U. S. National Commission for UNESCO.

National Commission News appears to be available without charge from the Gov. Ptg. Office, Washington, D. C.

REPORTING ON NTA'S MILLION DOLLAR OPERATION

The 40 page 1946-47 *Annual Report of the National Tuberculosis Association* is a condensed story of the wide ranging activities of this 43 year old national organization with affiliated associations in each of the states and territories of the United States.

The year's activities are classified under public health, medicine, and research. The report shows an expansion into broader fields than tuberculosis. Seven states are now also using seal sale funds for programs on heart disease, social hygiene, cancer control, diphtheria prevention, rheumatic fever, or dental hygiene.

The 1946 seal sale netted more than 17 million dollars of which all but 5 per cent was retained by the state and local associations that raised the amounts. The total income and expenditures of the national association alone were nearly a million dollars.

WORTH ACQUIRING

Nursing Is a Good Profession—In simple language and humorous illustrations this answers such questions as "How do I find out how to become a registered nurse, what do I need by way of education, how do I choose a school, what will it cost, and what are my opportunities after I graduate?" and many others that the high school student or her parents might ask in deciding upon a nurse career. This should be a valuable help in the current nurse recruitment program. Available from Nursing Information Bureau, 1790 Broadway, New York 19, at 5 cents each or $4 per 100.

Medicine's Fifth Column, by Virgil H. Moon, M.D., Jefferson Medical College Professor of Pathology, has been reprinted from the *Ladies Home Journal.* It is a popular argument against the perennial attempts of antivivisectionists to get state laws passed prohibiting animal experimentation by medical scientists. Available from National Society for Medical Research, 25 E. Washington St., Chicago 2.

A Digest of Nutrition Conferences. This is a report of a series of nutrition conferences conducted by Stuart W. Adler, M.D., Director of the Maternal and Child Health Division of the New Mexico Department of Public Health, and Walter Wilkins, Surgeon (R), U.S.

Public Health Service in 1944. It was first published in 1945 as Vol. 12, No. 2 of the *New Mexico Health Officer* and a supply has now been reprinted. This material, representing an example of postgraduate education, is still of vital interest and is as up-to-date now in concept as when the conferences were held. Available from New Mexico Department of Public Health, Santa Fe, N. M.

Growing Healthfully — Prepared by Mabel Rugen, Professor of Health and Physical Education in the University of Michigan, and published by the National Tuberculosis Association, is a teaching unit for grades I–XII, attractively illustrated and includes a list of suggested publications and their source. Available from your local tuberculosis association.

A.P.H.A. membership application blank on page XXX.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.

The Yale Journal of Biology and Medicine—C.-E. A. Winslow Number—New Haven, Conn.: Yale University, March, 1947, Vol. 19, No. 4. pp. 393–800.

It does not happen frequently that the Managing Editor of this *Journal*, responsible as he is for scanning some forty to fifty books each month and assigning them for review, seizes one with selfish pleasure and reserves it to himself. It almost never happens that the *Journal* reviews a special issue of a periodical. Both these departures from ordinary behavior are occasioned by the C.-E. A. Winslow Number of the *Yale Journal of Biology and Medicine*.

Thirty-nine contributions make up this Festschrift volume for Professor Winslow as he retires as Anna M. R. Lauder Professor of Public Health at Yale University and as Head of the Department. The diverse interests of these contributors reflect the extraordinary versatility of Professor Winslow who is not only a teacher of national and international influence but vitally interested in international health organization, in better administrative practice, in industrial hygiene, in voluntary health agencies, in public housing, in sanitary engineering, in epidemiology, in health education, in school health, in public health nursing, in medical care, in health insurance, in nutrition, in heating, lighting and ventilation, and in making public health a true profession.

As Dr. W. P. Shepard has said, it is not often that within the short span of one man's career he sees the emergence of his chosen field from an aggregation of specialists in various professions to a profession in its own right. It is still more rare for one man to have had so much to do with that emergence. Professor Winslow has seen public health grow into a profession. No one individual has contributed more to this process of professionalization than he.

Among the contributors are Ira V. Hiscock, Thomas Parran, Sir Wilson Jameson, Philip S. Platt, Leonard Greenburg, John R. Paul, Howard J. Shaughnessy, Ruth Grout, Lucy Morgan, Franklin Foote, Charles Wilson, Martha Eliot, Louis I. Dublin, Leona Baumgartner, Hugh R. Leavell, and the late Courtney Smith. The final chapter represents a bibliography of Professor Winslow, including 574 items in addition to the extensive contributions he has made through such publications as the *New York State Health News*, the *Journal of Bacteriology* (Editor, 1916–1944), and his service as Editor of the *American Journal of Public Health* since April, 1944.

The industry and diligence of the persons who compiled the bibliography must be commended, inasmuch as Professor Winslow himself remarked that many references were turned up which he had entirely forgotten. The one way to have improved it would have been to assign someone to shadow this remarkable man through the years with the sole responsibility of recording for posterity the innumerable gracious and erudite acknowledgments, introductions, and responses made without benefit of manuscript and that are now lost except to those who heard them and remembered.

Altogether this is one of the most successful Festschrifts that have come to

the reviewer's attention. It is not only well made up and representative of Professor Winslow, but it is a fine volume in itself worthy of a place in every library. REGINALD M. ATWATER

Medicine in the Changing Order. *Report of the New York Academy of Medicine, Committee on Medicine and the Changing Order. New York: Commonwealth,* 1947. 240 pp. Price, $2.00.

Shortly after it came into being in 1942, the New York Academy of Medicine's "Committee on Medicine and the Changing Order" (Malcolm Goodridge, Chairman) defined its objectives as follows: "To be informed on the nature, quality, and direction of the economic and social changes that are taking place now and that are clearly forecast for the immediate future; to define in particular how these changes are likely to affect medicine in its various aspects; to determine how the best elements in the science of medicine and in its services to the public may be preserved and embodied in whatever new social order may ultimately develop."

The Committee was comprised of some 33 physicians and 17 representatives of allied professions and lay persons. Nursing and dentistry were represented. The lay members were drawn from the ministry, the law, social welfare, the hospital, insurance, labor, and industry. The work of the Committee was given financial support by the Commonwealth Fund, the Milbank Fund, and the Josiah Macy, Sr. Foundation.

The Committee sought information and opinion from a wide variety of authorities. Subcommittees were appointed to organize and study the material thus obtained and to make special investigations of medical education; graduate and postgraduate medical education; the internship; the hospital; administration of public health services; extension of medical services; the cost of diagnostic and consultant services; industrial medicine; rural medicine; nursing and dentistry. Under the aegis of the Committee some 10 authoritative monographs have been published which contain much of the factual material upon which the Report of the Committee is based.

In this brief review of the Committee's report it is not possible even to list its conclusions and recommendations, much less discuss them. About all that can be done is to point out that the study was planned thoughtfully and skillfully and that it was carried out expertly and with courage and objectivity. It is presented as a judicial, unbiased and constructive study of conditions pertaining to the problems of providing adequate medical care throughout the country. It will be accepted as such by judicious, unbiased readers. It ventilates and illuminates controversial areas of medicine and medical care which are often overheated and poorly lighted. Readers who are genuinely interested in the subject "Medicine and the Changing Order" cannot afford to miss this report. Those whose interest is centered upon preserving the *status quo* will find little in it to encourage them.

HUGH J. MORGAN

Manual for Public Health Nurses —1947–1948. *Minneapolis: Division of Public Health Nursing, Minneapolis: Minnesota State Department of Health.*

This manual covers all areas of public health nursing. It is arranged in two parts, administration and nursing activities. The table of contents with page numbers is an invaluable aid to the reader.

The material is introduced with a discussion of the relationship of the public health nurse to the state and local boards of health and it follows a logical presentation throughout. An admirable feature is the inclusion of per-

tinent records and forms with appropriate topics.

A diagram of the organization of the Minnesota Department of Health includes agencies with which the department coöperates. However, the State Department of Education is not listed.

Wider range of participation in program planning by all agencies concerned with health promotion than was indicated in several sections of the manual is desirable. A loose classification of certain agencies, professional organizations and other groups occasionally appears.

The authors of this manual are to be commended for this generally constructive contribution to public health nursing. Minnesota's public health nurses are fortunate in having this clearly defined and comprehensive manual as a guide in their work.

LULA P. DILWORTH

Penicillin: Its Practical Application — *By Sir Alexander Fleming. Philadelphia: Blakiston,* 1946. 380 pp. Price, $7.00.

The volume under review consists of a group of individual articles prepared by British authors, and deals with various phases of the clinical application of penicillin. Only the preface and a short chapter are Fleming's.

The preface reflects the character of the author in that it frankly draws attention to the fact that the clinical reviews are prepared on the basis of information available at the time of writing and that viewpoints will change as experience is accumulated. The volume will probably serve as a chronicle of the status of progress up to the date of publication.

As a reflection of current opinion it probably will not have many adherents. The warning against the indiscriminate use of the antibiotic is timely. Possibly Fleming might have further emphasized the dangers which may accrue from the promiscuous use of the product in conditions in which the causative organisms are not identified or in which other forms of treatment are known to be effective. Not only is this practice unsound but it may have the effect of reducing the efficacy of penicillin in patients confronted by a lethal emergency caused by pathogens which would have been susceptible under ordinary circumstances.

JOHN F. MAHONEY

Rehabilitation Through Better Nutrition—*By Tom D. Spies, M.D. Philadelphia: Saunders,* 1947. 94 pp. Price, $4.00.

This monograph is of timely value to public health physicians, nutritionists, and nurses as well as to private practitioners, medical students, and postgraduates for whom it is specifically planned.

Dr. Spies, a physician noted for outstanding research in nutritional deficiencies, succinctly describes the methods of diagnosis and principles of nutrition therapy which he has found so successful in rehabilitating hundreds of malnourished patients.

Emphasis is placed on the many factors present in nutritive failure and the four essential steps in treatment, including recognition of the time element. Diagnosis of vitamin and protein deficiencies and various anemias is followed by detailed description of therapeutic principles and results. Use of foods, synthetic vitamins and supplementary products is illustrated with four different meal plans.

Excellent photographs of clinical manifestations and simple charts of findings lend clarity and interest.

DOROTHEA E. NICOLL

Public Health Nursing in Syphilis and Gonorrhea—*By Evangeline Hall Morris. Philadelphia: Saunders,* 1946. 239 pp. 18 illus. Price, $2.25.

The author states in the preface of her book that it is an "attempt to deal with current problems of the social hygiene program and to include related material which is of special interest." The book accomplishes these aims well and the author has given us a wealth of factual material about the venereal disease program in its broadest scope. The historical sidelights provide interesting background in understanding the many attitudes and misinformation about the diseases.

The chapter on Family Life Education deals with the prevention of the disease and the manifold implications.

The chapters on The Patient and His Needs, and The Work of the Public Health Nurse place emphasis on the need to treat the patient as an individual recognizing his many needs.

The bibliographies at the end of each chapter provide excellent references which will give the nurse more detailed information.

This brief volume provides an excellent reference book for public health nurses as well as all members of the professions. It will be especially valuable to students as a reference book.

HELEN E. WEAVER

Teaching in Schools of Nursing—*By Loretta A. Heidgerken, R.N. Philadelphia: Lippincott,* 1946. 478 pp. Price, $4.00.

This book on principles and methods of teaching by an assistant professor of nursing at the Catholic University of America is well organized, simple, and specific. There are adequate topic outlines, summaries, and index. Extensive, authoritative references are listed at the end of each chapter. Principles set forth are those currently accepted as sound, and the methods proposed are in harmony with these principles.

At a time when nursing is undertaking a study of conditions affecting the quality of nursing education, Miss Heidgerken calls attention to a crucial and often neglected point in the learning situation—the point where student and teacher meet. "The teacher determines the educational fate of her students by what and how she teaches." This concept of the teacher's part in the development of a good nurse is consistently maintained.

The book should prove useful for teachers and even more specifically for prospective teachers of nurses.

MARGERY T. OVERHOLSER

State-Local Relations—*Report of the Committee on State-Local Relations. Chicago: Council of State Governments,* 1946. 228 pp. Price, $3.50.

With the shrinking of the world due to ever faster means of communication and transportation and with the social revolution of the last decade, the interrelationships of federal, state and local governments have of necessity also changed. Recognizing the need for clarifying these relations, the Council of State Governments in 1945 established a Committee on State-Local Relations to study the broad field and to develop a report with definite recommendations.

The present volume is the report of that committee's work. The general summary of the report and the summaries preceding each of the six chapters are excellent. Although the committee's recommendations are nowhere categorical and various alternatives are reasonably presented, the direction of necessary changes is nevertheless obvious.

The recommendations are definitely not in the direction of more centralized state government but rather for greater powers to local units of government. To reach this goal, however, the long run pattern of local government must undergo a fundamental reorganization. Changes in structure must look toward one local government for one local area, for a local government large enough in terms of population to permit effective

public services at low cost and wealth enough to support a substantial portion of those services. It suggests various ways of meeting these goals, the city-county consolidation, for example, in urban areas and consolidation of counties in rural areas. It estimates, for example, that two-thirds of all the counties in the United States have areas of less than 800 square miles which is suggested as a conservative size of convenience; nearly two-thirds of counties and 95 per cent of towns and townships have populations of less than 25,000.

This is a valuable reference work for anyone who must deal with various levels of government and particularly for the state official whose task is to further consolidation of local units. He will also find this bit of useful advice, "The persuasive devices of supervision are the most effective."

MARTHA LUGINBUHL

A Medical Survey of the Bituminous Coal Industry: Report of the Coal Mines Administration— *Washington, D. C.: U. S. Government Printing Office,* 1947. 224 pp. XXIV pp. foreword and preface. Supplement, 67 pp. Price, $1.75.

The study was made under the direction of Rear Admiral Joel T. Boone, Medical Corps, U. S. Navy, by a staff of naval officers, enlisted men and civilian technical advisers, pursuant to Section 5 of the agreement of May 29, 1946, made by J. A. Krug, then acting as Coal Mines Administrator of the U. S. Government (now Secretary of the U. S. Department of Interior), and the President of the United Mine Workers of America, John L. Lewis.

Under the terms of Section 5, the Coal Mines Administrator agreed to have made, "A comprehensive survey and study of the hospital and medical facilities, medical treatment, sanitary, and housing conditions in the coal mining areas. The purpose of this survey will be to determine the character and scope of improvements which should be made to provide the mine workers of the nation with medical, housing, and sanitary facilities conforming to recognized American standards."

The bituminous coal industry is big industry. In 1946, more than 525½ million tons of bituminous coal were mined in the United States. The largest part of this was produced in eight of the states, but twelve other states also produced considerable amounts. In the year 1945, more than 383,000 men were employed in 7,033 bituminous coal mines. An index of the economic status of the bituminous coal miner may be obtained from a consideration of a few basic figures. In 1945, the average hourly earnings were $1.24 but there has always been great variation in the number of hours worked each year in the same mine and among the various mines. The report gives the estimated average annual earning of bituminous coal miners for the year 1945 as $2,650.

The field work of the study was done by five field teams, each composed of a medical officer, an engineering officer, and a welfare and recreation officer, together with a chief yeoman as clerk. The selection of the mines to be studied was based on a population basis with a random selection of the mines themselves. "In those districts in which the population of miners was largest, the most mines were selected." As a result, 14 per cent of the mines in government custody (260 mines), employing 22 per cent of the miners (71,850), and yielding 18 per cent of the coal output, were studied. In the opinion of the reviewer, this sampling procedure was eminently satisfactory and undoubtedly yielded representative findings.

The body of the report is presented in seven sections, namely, housing and sanitary facilities, public health, industrial medicine, general medical services, hospitalization, hospital facilities, and off-

the-job living. Each of these is in turn broken down into a number of sub-headings in which the material is presented in a summary fashion which is unusally succinct but, nevertheless, so well substantiated factually as to be very convincing. For example, the section on housing presents a discussion of sites, roads, architecture, bathrooms, age of houses, occupancy, maintenance, screening, housekeeping, fire protection, heat and light, leases and sales, bachelor quarters, water supplies, sewage disposal, garbage collection and disposal, and wash houses.

It is quite impossible, in the space of a brief review, to present a detailed discussion of the findings of this large report. Suffice it to say that in general the provisions and facilities were disclosed to range in quality from very bad to good. To cite a simple example, bathrooms were observed in only 10 per cent of company owned houses, while of privately owned houses 31 per cent had bathrooms with tubs or showers or both. Some 11.6 per cent of company owned houses were provided with sewage systems and septic tanks, while 41.7 per cent of privately owned houses were so provided.

It is quite apparent that the coal worker does not share the degree of benefits which one finds other workers of approximately the same economic status enjoying. The report concludes with six pages of recommendations which point up to the important future steps which must be taken to bring the coal mining industry and the workers in the industry to what might be considered the general level surrounding the workers of similar economic status of other industries in the country. The report closes with a supplement, *The Coal Miner and his Family*. This presents a very interesting picture of the life and surroundings of the coal miner, separate from his occupation. The topography and make-up of the report is excellent and throughout one finds photographs which are at the same time interesting and informative and fine examples of the photographer's art.

The Coal Mines Administrator and the Director of the Medical Survey Group are to be congratulated on the production of a most interesting and valuable public health document.

LEONARD GREENBURG

Babies Don't Bounce—*By Bil Sullivan. New York: McGraw Hill*, 1947. 48 pp. Price, $1.50.

The author of this book of amusing and instructive cartoons in eye catching blue and pink, presents his points with the realism of actual experience. He is the father of Kathy, 4½, and Bil, Jr., 6 months.

Part One deals with Baby vs the Home, and Part Two is entitled, Baby Goes Out.

In forty-one lively sketches as many common hazards are pointed out. As the foreword says: "Keeping an eye on Baby is a twenty-four hour job but it's worth it! Wee One reacts automatically to noise, motion and various original ideas of his own, though not always in the best interests of safe living. Our purpose is to give mother (and Dad too) pointers on how to anticipate the entanglements her offsprings may get into in the course of everyday living."

The public health nurse and pediatrician may find this little text a useful tool in safety education.

E. M. HENDRIKSEN

The Future of Housing — *By Charles Abrams. New York: Harper*, 1946. 428 pp. Price $5.00.

The United States has no housing policy or program. Instead we have a serious nation-wide problem and no immediate prospects for its solution. Until more voters know more about the morass of housing, there is unlikely to be legislative enthusiasm to tangle with the

basic issues involved in providing decent shelter for all Americans.

Mr. Abrams's latest book would be interesting even if it was not important. Seldom does an author treat so effectively such fundamental issues as are set forth and discussed in this volume. In each of 5 parts (The Problem, The Real Estate and Construction Enterprises, The Era of Enlightenment, The Housing Agencies, and Toward Solution) the facts are presented clearly, discussed intelligently, and utilized constructively. *The Future of Housing* is likely to evoke indignant bleats from the vested interests in real estate and building construction, if any of them perchance should read it.

Public health personnel who study this volume may be startled and in all likelihood will be stimulated to further their knowledge of and interests in housing. For the health administrator, the chapters on the housing problem, planning, and the aims of a housing program are particularly pertinent.

M. ALLEN POND

Physical Fitness Workbook—*By Thomas Kirk Cureton. (2nd ed.) St. Louis: Mosby*, 1947. 150 pp. Price, $2.50.

This workbook, designed for college men, describes the plan used at the University of Illinois for appraising physical fitness and progress made in improving such fitness. Physical fitness is conceived as including: physique, organic efficiency and motor fitness—a concept associated with physical efficiency in an earlier era. Physique is determined by a series of anthropometric measures—girths, skeleton, fat, vital capacity, and muscle tone. Organic efficiency is determined by tests of respiratory fitness (e.g. breath holding), and cardiovascular efficiency (e.g. Schneider Test and adaptations). Motor fitness is determined through an elaborate battery of physical stunts and exercises designed to "measure" flexibility, balance, agility, endurance, and strength. The soundness of this concept of physical fitness may be questioned since little attention is given to the health examination (required *only* before motor fitness tests are given), and the correction of remediable conditions, or to health practices other than exercise. In other words the conditions which must be present before the physiological benefits of exercise are likely to accrue are not considered in this reference. The workbook has greater value, albeit limited, in the improvement of the physical education program in the college than in contributing to the health program. MABEL E. RUGEN

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

THE ADMINISTRATIVE INTERNSHIP IN THE HOSPITAL. A Manual and Guide. By Paul B. Gillen and Charles E. Prall. Chicago: Joint Commission on Education, 1947. 32 pp.

ADVANCES IN PEDIATRICS, Vol. II. Edited by S. Z. Levine, Allan M. Butler, L. Emmett Holt, Jr., and A. Ashley Weech. New York: Interscience, 1947. 409 pp. Price, $6.75.

ANATOMY AND PHYSIOLOGY FOR STUDENTS OF PHYSIOTHERAPY, OCCUPATIONAL THERAPY AND GYMNASTICS. By C. F. V. Smout, M.D. and R. J. S. McDowall, M.D., D.Sc. (2nd ed.). Baltimore: Williams & Wilkins, 1947. 470 pp. Price, $8.00.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES. Volume XLVII, Art. 6. "Muscular Contraction." By Alexander Sandow, *et. al.*, New York: Academy of Sciences, 1947. pages 665–930. Price, $3.00.

THE CAUSATION OF APPENDICITIS. By A.

Rendle Short, M.D. Baltimore: Williams & Wilkins, 1947. 79 pp. Price, $2.50.

CINEPLASTY. By Henry H. Kessler, M.D., Ph.D. Springfield, Ill.: Thomas, 1947. 201 pp. 314 illus. Price, $6.75.

CONCISE ANATOMY. By Linden F. Edwards, Ph.D. Philadelphia: Blakiston, 1947. 548 pp. 472 illus. Price, $5.50.

CURARE. ITS HISTORY, NATURE, AND CLINICAL USE. By A. R. McIntyre, M.D. Chicago: University of Chicago Press, 1947. 240 pp. Price, $5.00.

THE DEVELOPMENT OF MODERN MEDICINE. By Richard Harrison Shryock. New York: Knopf, 1947. 457 pp. Price, $5.00.

DISEASES TRANSMITTED FROM ANIMALS TO MAN. By Thomas G. Hull, Ph.D. (3rd ed.) Springfield, Ill.: Thomas, 1947. 571 pp. Price, $10.50.

EFFECTS OF SOIL ELEMENTS ON FOOD. A SYMPOSIUM. By T. J. Brooks. Tallahassee: Florida State Department of Agriculture. 175 pp.

GENETICS, MEDICINE, AND MAN. By H. J. Muller, C. C. Little, and Laurence H. Snyder. Ithaca, N. Y.: Cornell University Press, 1947. 158 pp. Price, $2.25.

INDIA AND AMERICA. By Professor B. J. Vaswani. Syracuse, N. Y.: Chaturi B. Vaswani, 1947. 88 pp. Price, $.50.

INSECT PESTS. By Wm. Clunie Harvey, M.D., D.P.H., and Harry Hill. (2nd ed.) London: H. K. Lewis & Co. Ltd., 1947. 347 pp. 27 illus. Price 14s net.

INSIDES OUT. By John Mason Brown. New York: McGraw-Hill, 1947. 202 pp. Price, $2.00.

MEDICAL, LEGAL AND SOCIAL APPROACHES TO THE PROBLEMS OF INEBRIETY. Proceedings of a Conference Sponsored Jointly by the Research Council on Problems of Alcohol and the New York Academy of Medicine. New York: Research Council on Problems of Alcohol, 1947. 60 pp. Price, $.50

THE MUNICIPAL YEAR BOOK 1947. Edited by Clarence E. Ridley and Orin F. Nolting. Chicago: International City Managers' Association, 1947. 550 pp. Price, $8.50.

THE NATIONAL HEALTH SERVICE ACT, 1946. By J. A. Scott, O.B.E., M.D., D.P.H., and H. A. C. Sturgess. London: Eyre & Spottiswoode, 1947. 93 pp. 9s 6d net.

THE PSYCHOBIOLOGICAL PROGRAM OF THE WAR SHIPPING ADMINISTRATION. Edited by George G. Killinger with a foreword by Captain Edward Macauley, USN (Ret.) and an introductory chapter by Justin K. Fuller, Assistant Surgeon General, USPHS. Stanford University, Calif.: Stanford University Press, 1947. 351 pp.

THE ROAD TO SCHOOL HEALTH. Guides for Better School Health. Bulletin No. 1. Madison: Wisconsin Cooperative School Health Program, 1947. 20 pp.

REPORT OF THE MINISTRY OF HEALTH FOR THE YEAR ENDED 31ST MARCH 1946, INCLUDING THE REPORT OF THE CHIEF MEDICAL OFFICER ON THE STATE OF THE PUBLIC HEALTH FOR THE YEAR ENDED 31ST DECEMBER 1945. Presented by the Minister of Health to Parliament by Command of His Majesty, May 1947. London: His Majesty's Stationery Office. 193 pp. Price, 3s 6d. net.

THE SANITARY INSPECTORS HANDBOOK. By H. H. Clay (6th ed.) London: H. K. Lewis & Co, 1947. 546 pp. 99 illus. Price, 22s net.

SCHOOL HEALTH AND HEALTH EDUCATION. By C. E. Turner, D.Sc., Dr.P.H., with the editorial assistance of C. Morley Sellery, M.D. St. Louis, Mo.: Mosby, 1947. 457 pp. Price, $3.50.

SOCIAL AGENCIES OF THE CITY OF NEW YORK 1946–47. Prepared under the director of the Committee on Information Services of the Welfare Council. New York: Columbia University Press, 1947. 424 pp. Price, $4.50.

STATE CENTRAL CASE RECORD SYSTEMS AND LOCAL CASE REGISTERS FOR TUBERCULOSIS. Washington, D. C.: Federal Security Agency, U. S. Public Health Service, Tuberculosis Control Division, 1947. 88 pp.

UNION HEALTH CENTER TRIENNIAL REPORT. International Ladies Garment Worker's Union 1944–46. New York: 275 Seventh Avenue. 51 pp.

UNTO THE LEAST OF THESE. SOCIAL SERVICES FOR CHILDREN. By Emma Octavia Lundberg. New York: Appleton-Century, 1947. 424 pp. Price, $3.75.

VITAL STATISTICS 1944 (24TH ANNUAL REPORT). CANADA—DOMINION BUREAU OF STATISTICS. Ottawa: Edmond Cloutier—King's Printer and Controller of Stationery, 1946. 765 pp. Price, $1.00.

WATER SUPPLY AND SEWERAGE. By Ernest W. Steel (new 2nd ed.). New York: McGraw-Hill. 666 pp. Price, $6.00.

THE YALE JOURNAL OF BIOLOGY AND MEDICINE —C.-E. A. Winslow Number, March, 1947. Vol. 19, No. 4. pp. 339–800. New Haven, Conn.

THE YEARS AFTER 50. By Wingate M. Johnson, M.D. Foreword by Morris Fishbein, M.D. New York: McGraw-Hill, 1947. 153 pp. Price, $2.00.

Preliminary Program of the Scientific Sessions of the 75th Annual Meeting of the American Public Health Association and Meetings of Related Organizations Atlantic City, N. J., October 6–10, 1947

THE Annual Meeting Program Committee offers a preview of the content of scientific sessions planned in connection with the 75th Annual Meeting in Atlantic City, N.J. The professional affiliations and addresses of speakers are not given, but a complete index to participants will be published in the final program which will be distributed to all delegates at the Registration Desk, Convention Hall. Registration headquarters will be opened at noon on Monday, October 6.

AMERICAN PUBLIC HEALTH ASSOCIATION GOVERNING COUNCIL

Monday, 9:30 A.M. First Meeting—Room B, Convention Hall

MERIT SYSTEM UNIT

Monday, 12:30 P.M. Luncheon Session—Room 125, Hotel Ambassador

EVALUATING MERIT SYSTEM PRINCIPLES ON PUBLIC HEALTH

MONDAY, 2:30 P.M.

FOOD AND NUTRITION AND LABORATORY SECTIONS

Joint Session—Room C, Convention Hall

Presiding: CHARLES G. KING, Ph. D., and SARA E. BRANHAM, M.D.

The Laboratory Diagnosis of Staphylococcus Food Poisoning. GAIL M. DACK, M.D.

The Training of Food Handlers in Institutions. FERDINAND A. KORFF.

Susceptibility to Typhus of Rats on Deficient Diets. FLORENCE K. FITZPATRICK.

Microbiology of Frozen Foods. BERNARD E. PROCTOR, Ph.D.

Studies Showing the Effect of Changes in the New (9th) Edition of Standard Methods in Relation to the Bacteriological Analysis of Milk. ROBERT C. THOMAS, BENJAMIN S. LEVINE, Ph.D., and LUTHER A. BLACK, Ph.D.

Committee Reports:

Standard Methods Committee on Examination of Milk and Milk Products. *Chairman*, A. H. ROBERTSON, Ph.D.

Joint Standard Methods Committee on Frozen Desserts and Ingredients. A. H. ROBERTSON, Ph.D.

Joint Committee on Analyzing Frozen Desserts. *Chairman*, FREDERICK W. Fabian, PH.D.

MONDAY, 2:30 P.M.

ENGINEERING SECTION AND CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

Joint Session—Room A, Convention Hall

Presiding: W. SCOTT JOHNSON and HENRY D. PETERS.

Report of Engineering Section Committee on Municipal Public Health Engineering. *Chairman,* JAMES L BARRON, C.E.

Report of Engineering Section Committee on Water Supply. *Chairman,* CHARLES R. COX.

Public Health Aspects and Administrative Supervision of the Introduction of Chemicals Into Water for Controlling Corrosion and Scaling of Plumbing Systems.

Panel Leader: SOL PINCUS, C.E.

Participants:
CHARLES R. COX.
JOEL I. CONNOLLY.
EDWARD S. HOPKINS.
HARRY E. JORDAN.

Hydrological and Bacteriological Studies of Fort Loudown Reservoir Swimming Area. ROBERT N. CLARK.

Environmental Health Problems Created in Connection with Decentralization Trend as Observed in Flint, Mich. LEONARD BOARD and HERBERT J. DUNSMORE.

Report of Engineering Section Committee on Sewage Disposal. *Chairman,* LANGDON PEARSE.

Activities of the Merit System Unit of the A.P.H.A. in the Field of Environmental Sanitation. JAMES L. BARRON, C.E.

EPIDEMIOLOGY

First Session—Room B, Convention Hall

Presiding: JAMES E. PERKINS, M.D. *Chairman.*

Eradication of Tuberculosis by Epidemiological Methods. J. A. MYERS, M.D.

Studies of Pulmonary Calcification. B. J. OLSON, M.D., C. W. EMMONS, LEON FLANCHER, M.D., and JOSEPH A. BELL, M.D.

Epidemiology of Histoplasmin Sensitivity. IVAN BUNNELL, M.D., M. L. FURCULOW, M.D., and CARROLL E. PALMER, M.D.

The Significance of Rare Bacilli in Sputum from the Standpoint of Public Health. F. M. POTTENGER, M.D.

Summary of State Tuberculosis Control Activities. FRANCIS J. WEBER, M.D., and ROBERT J. ANDERSON, M.D.

MONDAY, 2:30 P.M.

HEALTH OFFICERS, PUBLIC HEALTH NURSING, AND PUBLIC HEALTH EDUCATION SECTIONS, AND PUBLIC HEALTH VETERINARIANS

Joint Session—Ballroom, Convention Hall

Presiding: RICHARD F. BOYD, M.D., MARY C. CONNOR, R.N., MABEL E. RUGEN, Ph.D., and JAMES H. STEELE, D.V.M.

The Public Health Nurse's Contribution in the Annual Planning of a Public Health Program. MARION W. SHEAHAN, R.N.

The Place of Public Health Education in a Public Health Program. MAYHEW DERRYBERRY, Ph.D.

The Relation of Animal and Food Sanitation to the Public Health of the Community. JAMES H. STEELE, D.V.M., and MARTIN BAUM, D.V.M.

(Title to be announced). WILLIAM H. CARY, JR., C.E.

The Coördination and Integration of the Public Health Program. HENRY F. VAUGHAN, Dr.P.H.

General Discussion.

MATERNAL AND CHILD HEALTH

First Session—Room D, Convention Hall

Presiding: VIKTOR O. WILSON, M.D., *Chairman.*

Description of the "Rooming-In" Program for the Care of New-born Infants at the New Haven Hospital. EDITH B. JACKSON.

Observation on Unapproved Behavior in Year Old Infants. C. ANDERSON ALDRICH.

Free Choice in Preschool Feeding in the Home. MARGARET F. GUTELIUS, M.D.

The Beginnings of a Preventive Mental Health Program in the State and Local Health Departments. KENT A. ZIMMERMAN, M.D.

Health Services Furnished to Children by Official and Voluntary Health Agencies in Selected States. CHARLES L. WILLIAMS, M.D., KATHERINE BAIN, M.D., and JOHN P. HUBBARD, M.D.

SCHOOL HEALTH

First Session—Room 20, Convention Hall

Presiding: GEORGE M. WHEATLEY, M.D., *Chairman.*

Election of Officers.

Anemia in School Children. WALTER WILKINS, M.D.

The Place of Fluorine in the Dental Health Program for Children. JOHN W. KNUTSON, D.D.S.

A Study of Vision-Testing Procedures. THOMAS E. SHAFFER, M.D.

A Study of Absenteeism in Canadian Schools. A. J. PHILLIPS, Ph.D.

MONDAY, 2:30 P.M.

VITAL STATISTICS

First Session—Room 21, Convention Hall

Presiding: RUTH R. PUFFER, Dr.P.H., *Chairman.*

Section Business.

NATIONAL AND INTERNATIONAL VITAL STATISTICS

Activities of State and Federal Agencies. ALBERT E. BAILEY, Ph.D.

Medical Attendance During Terminal Illness. MARTA FRAENKEL, M.D.

United Nations Statistical Organizatien. FORREST E. LINDER, Ph.D.

International Statistical Congress. DARIO CURIEL, M.D.

MERIT SYSTEM UNIT

Room 1, Convention Hall

Presiding: LILLIAN D. LONG, PH.D.

CAN PROFESSIONAL PUBLIC HEALTH PERSONNEL BE SELECTED BY WRITTEN EXAMINATION? AN EXCHANGE OF EXPERIENCES

Program to be announced.

MONDAY, 5:00 P.M.

RECEPTION TO THE PRESIDENT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

Renaissance Room, Hotel Ambassador, 5–7 P.M., Informal

MONDAY, 6:30 P.M.

ENGINEERING SECTION, CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS, AND CONFERENCE OF STATE SANITARY ENGINEERS

Annual Engineers' Stag Dinner, Venetian Room, Hotel Ambassador.

"Bill" Orchard, Master of Ceremonies

PUBLIC HEALTH EDUCATION

Dinner Session—Room 125, Hotel Ambassador

Presiding: MABEL E. RUGEN, Ph.D., *Chairman.*

Section Business.

TUESDAY, 8:30 A.M.

NATIONAL ADVISORY COUNCIL OF THE CLEVELAND HEALTH MUSEUM

Breakfast Session—Rooms 110-111, Hotel Ambassador

TUESDAY, 9:30 A.M.

DENTAL HEALTH

First Session—Room A, Convention Hall

Presiding: RICHARD C. LEONARD, D.D.S.

Studies of Fluoride Removal From Drinking Water. F. J. MAIER, D.D.S

Topical Application of Fluorine Solution to Teeth. J. F. VOLKER, D.D.S.

Lactic Acid Bacillus Counts and Their Relationship to Dental Caries. FRANCIS A. ARNOLD, JR., D.D.S.

The Relationship of Tryptophane to the Incidence of Caries. NAOMI C. TURNER.

Studies of Vitamin K and Dental Caries. L. S. FOSDICK, Ph.D.

ENGINEERING AND INDUSTRIAL HYGIENE SECTIONS

Joint Session—Room D, Convention Hall

Presiding: W. SCOTT JOHNSON and HELMUTH H. SCHRENK, Ph.D.

AIR HYGIENE

Report of Engineering Section Committee on Air Pollution. *Chairman*, H. A. WHITTAKER.

Effectiveness of Germicidal Radiant Energy on Air-Borne Respiratory Microörganisms. MATTHEW LUCKIESH, M.D., A. H. TAYLOR, and THOMAS KNOWLES.

The Effect of Ultra-violet Irradiation of the Air on Air Bacteria. WILLIAM F. WELLS.

Essentials for the Control of Ragweed. ALFRED H. FLETCHER and ISRAEL WEINSTEIN, M.D.

Engineering Section Business Session.

FOOD AND NUTRITION

First Session—Room 21, Convention Hall

Presiding: MARJORIE M. HESELTINE, *Vice-Chairman.*

Section Business.

INTERNATIONAL FOOD AND NUTRITION SITUATION

(Speakers to be announced).

TUESDAY, 9:30 A.M.

HEALTH OFFICERS

First Session—Room C, Convention Hall

Presiding: RICHARD F. BOYD, M.D., *Chairman.*

ESSENTIALS OF GOOD LOCAL PUBLIC HEALTH ADMINISTRATION

Panel Leader: V. A. VAN VOLKENBURGH, M.D.

Participants:

EARLE G. BROWN, M.D.
CARL E. BUCK, DR.P.H.
HARRY L. CHANT, M.D.
L. M. GRAVES, M.D.
F. M. HALL, M.D.
MARTIN MILLS, M.D.
D. A. REEKIE, M.D.
A. M. SHELAMER, M.D.
CARL A. WILZBACH, M.D.

LABORATORY

First Session—Room 20, Convention Hall

Presiding: SARA E. BRANHAM, M.D., *Chairman.*

Section Business.

Committee Reports:

Coördinating Committee on Standard Methods. *Chairman,* FRIEND LEE MICKLE, SC.D.

Standard Methods Committee on Diagnostic Procedures and Reagents. *Chairman,* RALPH S. MUCKENFUSS, M.D.

Standard Methods Committee on Diagnostic Procedures in Virus and Rickettsial Diseases. *Chairman,* THOMAS FRANCIS, JR., M.D.

Standard Methods Committee on Biology of the Laboratory Animal. *Acting Chairman,* PAUL A. MOODY, PH.D.

Standard Methods Committee on Biological Products. *Acting Chairman,* HAROLD W. LYALL, PH.D.

Committee for the Examination of Germicides and Antibacterial Agents. *Chairman,* STUART MUDD, M.D.

Committee on Salaries. *Chairman,* THOMAS F. SELLERS, M.D.

Report of the Laboratory Section Representative on the Commission for the Study of Biological Stains. EDMUND K. KLINE, DR.P.H.

Report of the Laboratory Section Archivist. ANNA M. SEXTON.

The Preparation of Rapid Antigens for the Diagnosis of Typhoid and Paratyphoid Fevers. BEN E. DIAMOND.

Comparative Efficiency of Rectal Swabs and Fecal Specimen in Detecting Typhoid and Salmonella Cases and Carriers. HOWARD J. SHAUGHNESSY, PH.D., FRANCES FRIEWER, and ADELE SNYDER.

TUESDAY, 9:30 A.M.

LABORATORY (Cont.)

Quick Micro-Techniques for Bacteriological Work. R. H. WEAVER, Ph.D.

Laboratory Diagnosis of Diphtheria in Two to Eight Hours; A Time-Honored but Much Neglected Method. JOAN B. DANIELS and MARY P. JOHNSON.

Isolation of Psittacosis-like Viruses from Pigeons. JOSEPH ZICHIS, Ph.D., HOWARD J. SHAUGHNESSY, Ph.D., and CATHERINE LEMKE.

MATERNAL AND CHILD HEALTH, EPIDEMIOLOGY, SCHOOL HEALTH, AND VITAL STATISTICS SECTIONS, AND THE COUNCIL ON RHEUMATIC FEVER OF THE AMERICAN HEART ASSOCIATION

Joint Session—Ballroom, Convention Hall

Presiding: VIKTOR O. WILSON, M.D., JAMES E. PERKINS, M.D., GEORGE M. WHEATLEY, M.D., RUTH R. PUFFER, Dr.P.H., and DAVID D. RUTSTEIN, M.D.

THE RHEUMATIC FEVER COMMUNITY PROGRAM—
ITS VALUE IN THE EPIDEMIOLOGICAL STUDY OF RHEUMATIC FEVER

Diagnostic Facilities. CHARLES A. R. CONNOR, M.D.

Nursing Follow-up. MARY PARKER, R.N.

Medical Social Follow-up. FLORENCE MOSHER.

School Health Service. GEORGE M. WHEATLEY, M.D.

Principles of the Epidemiology of Chronic Disease. ALEXANDER D. LANGMUIR, M.D.

Panel Leader:

DAVID D. RUTSTEIN, M.D.

Participants:

JEAN DOWNES.
THOMAS D. DUBLIN, M.D.
SAMUEL WISHIK, M.D.

PUBLIC HEALTH EDUCATION

First Session—Rooms 1, 2, 3, 4, 5, 6, 10, Convention Hall

Meetings of All Cross-Section Committees.

Committee on Community Organization for Health Education. *Chairman,* CLAIR E. TURNER, Dr.P.H. *Room 1.*

Committee on Convention Public Health Education Practices. *Room 2.*

Materials and Publicity. *Chairman,* RAE K. SHOEMAKER.

Motion Picture Theatre. *Chairman,* THOMAS C. STOWELL.

TUESDAY, 9:30 A.M.

PUBLIC HEALTH EDUCATION (Cont.)

Press Relations. *Chairman,* ANNA B. TOWSE.

Scientific Exhibits. *Chairman,* MARIE HARRINGTON.

Committee on Coördination of Public Health Education Section with all Other Sections of the A.P.H.A. *Chairman,* MURIEL F. BLISS, Ph.D. *Room 3.*

Committee on Post-War Planning in Public Health Education. *Chairman,* MAYHEW DERRYBERRY, Ph.D. *Room 4.*

Committee on Public Health Films. *Chairman,* KENNETH D. WIDDEMER, *Room 5.*

Committee on Regionalism-Liaison with Social Science. *Chairman,* LUCY S. MORGAN, PH.D. *Room 6.*

Committee on Utilization of Commercial Advertising for Health. *Chairman,* EDNA M. KECH, *Room 10.*

PUBLIC HEALTH NURSING

First Session—Room B, Convention Hall

Presiding: MARY C. CONNOR, R.N., *Chairman.*

The Public Health Nurse in a Nutritional Appraisal Program. MARGARET MCLAUGHLIN, R.N.

Public Health Nursing in the Cancer Control Program. ROSALIE I. PETERSON, R.N.

Field Experience Facilities in Public Health Nursing. HELEN FISK, R.N

TUESDAY, 12:30 P.M.

PUBLIC HEALTH NURSING

Luncheon Session—Venetian Room, Hotel Ambassador

Presiding: MARY C. CONNOR, R.N., *Chairman.*

Section Business.

Reports by the Chairmen of the Standing Committees:

On Administration. MARION W. SHEAHAN, R.N.

On Education. ELLA MCNEIL, R.N.

On Eligibility. ALBERTA WILSON, R.N.

Report on the Merit System Examination Program for Public Health Nursing. DOROTHY DEMING, R.N.

Report on Joint Scholarship Awards. JESSIE STEVENSON, R.N.

Entertainment furnished by the State Organization for Public Health Nursing of New Jersey.

TUESDAY, 2:30 P.M.

FIRST SPECIAL SESSION

Ballroom, Convention Hall

Presiding: HARRY S. MUSTARD, M.D.

THE HERITAGE OF THE PAST—THE SEED OF THE FUTURE

YESTERDAY

Developments in the Field of Professional Education. WILLIAM P. SHEPARD, M.D.

Progress in the Area of Administration. HUGH R. LEAVELL, M.D.

The Development of Public Support. HOMER FOLKS.

Changing Problems Growing out of the Change in Composition of the Population. LOWELL J. REED, Ph.D.

LABORATORY AND ENGINEERING SECTIONS

Joint Session—Room C, Convention Hall

Presiding: SARA E. BRANHAM, M.D., and W. SCOTT JOHNSON.

Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman*, WALTER L. MALLMANN, PH.D.

Report of the Committee on Shellfish Sanitation. *Chairman*, MILTON H. BIDWELL.

Report of the Standard Methods Committee on Examination of Shellfish. *Chairman*, JAMES GIBBARD.

Shellfish Poisoning. JAMES GIBBARD.

Antibiosis Among Enteric Bacteria and Possible Effect on Coliform Index. PIERRE FREDERICO, PH.D., and MAX LEVINE, PH.D.

Report of the Subcommittee on Food Utensil Sanitation, Committee on Research and Standards. *Chairman*, W. D. TIEDEMAN.

Comments on Standardization of Test Methods of Surface Active Agents. HOWARD E. LIND, Ph.D.

Test for Detergents. WILLIAM G. WALTER.

Some Properties of Cationics in Sanitization. G. M. RIDENOUR, Ph.D., and EDWARD H. ARMBRUSTER.

A City Department of Health Program on the Improvement of Mechanical Dishwashing. WALTER L. MALLMANN, Ph.D., LEO ZAIKOWSKI and DAVID KAHLER.

INDUSTRIAL HYGIENE

First Session—Room B, Convention Hall

Presiding: HELMUTH H. SCHRENK, Ph.D., *Chairman*.

Interpretation of Permissible Limits. *Address of the Chairman*, HELMUTH H. SCHRENK, Ph.D.

TUESDAY, 2:30 P.M.

INDUSTRIAL HYGIENE (Cont.)

Recruitment and Training of Industrial Hygiene Personnel. LEONARD GREENBURG, M.D.

The Pattern of Industrial Hygiene Administration in the United States. WILLIAM T. INGRAM.

Health Problems Resulting from Newer Technological Developments. EMETT KELLY, M.D.

Section Business.

MERIT SYSTEM UNIT

Room A, Convention Hall

Presiding: REGINALD M. ATWATER, M.D.

PUBLIC PERSONNEL MANAGEMENT

Does Public Health Require Good Personnel Administration? (Speaker to be announced).

Public Health Under a Merit System—With Special Reference to the Selection of Professional Workers.

Panel Discussion.

Panel Leader and Participants to be announced.

TUESDAY, 8:00 P.M.

FIRST GENERAL SESSION

Ballroom, Convention Hall

Presiding: HARRY S. MUSTARD, M.D., *President,* American Public Health Association.

Festival Musical Program.

Address of Welcome: SAMUEL L. SALASIN, M.D.

Greetings from the American Medical Association. GEORGE F. LULL, M.D.

The Place of Nutrition in a Public Health Program. SIR WILSON JAMESON.

Presidential Address. HARRY S. MUSTARD, M.D.

Presentation of Sedgwick Memorial Medal Award.

WEDNESDAY, 8:30 A.M.

UNIVERSITY OF MINNESOTA

Breakfast Session—Venetian Room, Hotel Ambassador.

WEDNESDAY, 9:30 A.M.

DENTAL HEALTH

Second Session—Room 21, Convention Hall

Presiding: WALTER J. PELTON, D.D.S., *Chairman*.

Use of Title V Funds for Dental Health. J. THOMAS FULTON, D.D.S.

Observation of Dental Program in Sweden. FRANCIS A. STOLL.

Dentistry in the United Nations Program in Europe. GEORGE A. NEVITT, D.D.S.

A New Community Approach in Conducting Dental Programs. PAUL COOK.

Section Business.

ENGINEERING

First Session—Room 20, Convention Hall

Presiding: W. SCOTT JOHNSON, *Chairman*.

RESEARCH IN SANITATION

Report of Engineering Section Committee on Exploration of Research Needs. *Chairman*, BLUCHER A. POOLE.

Panel Discussion on Sanitation Research.

Panel Leader: BLUCHER A. POOLE.

Participants:

JOHN ANDREWS.
ROBERT W. BABIONE, CAPT., U.S.N.
JAMES B. BATY, Major, U.S.A.
J. R. SANBORN, Ph.D.
WALTER F. SNYDER.
ABEL WOLMAN, Dr. Eng.

SANITARY PROBLEMS IN TRANSPORTATION

Interstate Carrier Sanitation. H. N. OLD.

Human Waste Disposal from Railroad Passenger Cars. ABEL WOLMAN, Dr. Eng., and LLOYD K. CLARK.

Sanitation Factors in Air Transport. ROSS A. MCFARLAND, PH.D.

EPIDEMIOLOGY

Second Session—Room D, Convention Hall

Salmonella from Dogs and the Possible Relationship to Salmonellosis in Man. ARTHUR H. WOLFF, D.V.M., NORMAN D. HENDERSON, and GRACE L. MCCALLUM.

Dog, Fox, and Cattle Rabies in New York State. Evaluation of Control Procedures. ROBERT F. KORNS, M.D., and ALEXANDER ZEISSIG, D.V.M.

Elephant Tusks: A Source of Human Anthrax. ROY M. SEIDEMAN, M.D., and KENNETH M. WHEELER, PH.D

WEDNESDAY, 9:30 A.M.

EPIDEMIOLOGY (Cont.)

A State-wide Survey of Typhus Fever in Florida. ELSMERE R. RICKARD, M.D., and E. G. RILEY, M.D.

Epidemiology and Control of Murine Typhus in a Southern State. ARCHIE L. GRAY, M.D., and EMIL KOTCHER, SC.D.

An Outbreak of Smallpox in New York City. ISRAEL WEINSTEIN, M.D.

HEALTH OFFICERS

Second Session—Room B, Convention Hall

Public Health in Britain—The Changing Scene. SIR ANDREW DAVIDSON, M.D.

The Health Officer in Post-War Britain. SIR ALLEN DALEY, M.D.

Post-War Public Health Problems in a Large American City. BRUCE H. DOUGLAS, M.D.

Can Public Health Agencies Handle Poliomyelitis Alone? HART E. VAN RIPER, M.D.

How Much Control of Cancer? EARLE G. BROWN, M.D., and JOSEPH H. KINNAMAN, M.D.

INDUSTRIAL HYGIENE

Second Session—Room 21, Convention Hall

Medical and Nursing Problems for Small Plants. HAROLD P. LYON, M.D.

Medical Care Plans for Industrial Workers in Relation to Public Health Programs. LEE JANIS, M.D., and MILTON I. ROEMER, M.D.

Industrial Sanitation. RICHARD T. PAGE.

Progress Reports of Section Committees.

Section Business.

SCHOOL HEALTH, MATERNAL AND CHILD HEALTH, PUBLIC HEALTH EDUCATION, PUBLIC HEALTH NURSING, AND FOOD AND NUTRITION SECTIONS

Joint Session—Ballroom, Convention Hall

Presiding: GEORGE M. WHEATLEY, M.D., VIKTOR O. WILSON, M.D., MABEL E. RUGEN, Ph.D., MARY C. CONNOR, R.N., and CHARLES G. KING, Ph.D.

SYMPOSIUM ON THE PRE-SERVICE AND IN-SERVICE PREPARATION IN HEALTH OF SCHOOL PERSONNEL

The Role of the Board of Education and the Department of Health in the In-service Preparation of Classroom Teachers, School Administrators, School Nurses, and School Physicians. L. E. BURNEY, M.D., and BEN H. WATT, PH.D.

WEDNESDAY, 9:30 A.M.

SCHOOL HEALTH, MATERNAL AND CHILD HEALTH, PUBLIC HEALTH EDUCATION, PUBLIC HEALTH NURSING, AND FOOD AND NUTRITION SECTIONS (Cont.)

The Pre-service Preparation of Teachers and School Administrators. DOROTHY B. NYSWANDER, Ph.D., BERNICE MOSS, Ed.D., and ELIZABETH KELLEY, Ed.D.

The Contribution of the Medical School and the School of Public Health. IRA V. HISCOCK, Sc.D.

The Contribution of the School of Nursing and the Graduate Course of Public Health Nursing. RUTH FREEMAN, R.N.

Summary Roundtable with Participants from Sponsoring Sections.

Discussion Leader: WILLIAM P. SHEPARD, M.D.

Discussants:

School Health Section—RUTH E. GROUT, PH.D.

Maternal and Child Health Section—SAMUEL R. BERENBERG, M.D.

Public Health Education Section—BESS EXTON.

Public Health Nursing—HORTENSE HILBERT, R.N.

Food and Nutrition Section—BERTLYN BOSLEY, PH.D.

VITAL STATISTICS AND LABORATORY SECTIONS, AND THE BIOMETRICS SECTION OF THE AMERICAN STATISTICAL ASSOCIATION

Joint Session—Room C, Convention Hall

Presiding: RUTH R. PUFFER, DR.P.H., and SARA E. BRANHAM, M.D.

APPLICATION OF STATISTICAL METHODS TO LABORATORY DATA

On Development of Harmony Between Scientific Purpose and the Foundations of Statistical Method. WILLIAM R. THOMPSON, PH.D.

An Analysis of the Wilson-Worcester Method for Determining the Median Effective Dose of Hemophilus Pertussis Vaccine. MARGARET PITTMAN, PH.D., and JACOB E. LIEBERMAN.

Discussion: EDWARD WEISS.

Relative Errors of Bacteriological Plate Counting Methods. THOMAS L. SNYDER, PH.D.

Quantitative Vitamin Assay. CHESTER I. BLISS, PH.D.

WEDNESDAY, 12:30 P.M.

LABORATORY

Luncheon Session—Room 125, Hotel Ambassador

Presiding: SARA E. BRANHAM, M.D., *Chairman.*

Section Business.

Report on the Fourth International Microbiological Congress. STUART MUDD, M.D.

HARVARD PUBLIC HEALTH ALUMNI ASSOCIATION

Luncheon Session—Venetian Room, Hotel Ambassador

ORDER OF THE BOARS

Luncheon Session—Rooms 121-122, Hotel Ambassador

WEDNESDAY, 2:30 P.M.

GOVERNING COUNCIL

Second Meeting, Room B, Convention Hall

WEDNESDAY, 5:00 P.M.

PUBLIC HEALTH ADVISORY COMMITTEE OF THE NATIONAL SANITATION FOUNDATION

5:00 P.M., and Dinner Session—Rooms 110-111, Hotel Ambassador

PUBLIC HEALTH VETERINARIANS

5:00 P.M., and Dinner Session—Room D, Hotel Chelsea

EXECUTIVE COMMITTEE, SCHOOL HEALTH NURSING SECTION OF THE NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSING

5:00 P.M., Evening Session—Room 103, Hotel Ambassador

WEDNESDAY, 6:30 P.M.

CONFERENCE OF STATE DIRECTORS OF HEALTH EDUCATION

Dinner and Evening Sessions—Rooms 104-105, Hotel Ambassador

WEDNESDAY, 6:30 P.M.

CONFERENCE OF PROFESSORS OF PREVENTIVE MEDICINE

Dinner and Evening Sessions—Room C, Hotel Chelsea

NATIONAL COMMITTEE OF HEALTH COUNCIL EXECUTIVES

Dinner and Evening Sessions—Room 125, Hotel Ambassador

NEW JERSEY HEALTH AND SANITARY ASSOCIATION

Dinner and Evening Sessions—Renaissance Room, Hotel Ambassador

PUBLIC HEALTH CANCER ASSOCIATION

Dinner and Evening Sessions—Como Hall, Hotel Chelsea

WEDNESDAY, 8:30 P.M.

ENGINEERING SECTION COUNCIL AND POLICY ADVISORY COMMITTEE

Evening Session—Room 106, Hotel Ambassador

ASSOCIATION OF MATERNAL AND CHILD HEALTH AND CRIPPLED CHILDREN'S DIRECTORS

Evening Session—Room 120, Hotel Ambassador

ASSOCIATION OF RESERVE OFFICERS OF THE U. S. PUBLIC HEALTH SERVICE

Evening Session—Surf Room, Hotel Ambassador

ASSOCIATION OF STATE AND TERRITORIAL HEALTH OFFICERS

Evening Session—Rooms 121-122, Hotel Ambassador

PUBLIC HEALTH METHODS STUDY SECTION OF THE U. S. PUBLIC HEALTH SERVICE

Evening Session—Room 107, Hotel Ambassador

WEDNESDAY, 8:30 P.M.

BACTERIOLOGY STUDY SECTION OF THE U. S. PUBLIC HEALTH SERVICE

Evening Session—Room 108, Hotel Ambassador

COUNCIL OF STATE DIRECTORS OF PUBLIC HEALTH NURSING

Evening Session—Room 102, Hotel Ambassador

JOINT COMMITTEE ON SCHOOL NURSING OF THE NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSING

Evening Session—Room 109, Hotel Ambassador

THURSDAY, 8:30 A.M.

UNIVERSITY OF MICHIGAN ALUMNI

Breakfast Session—Como Hall, Hotel Chelsea

YALE UNIVERSITY ALUMNI

Breakfast Session—Room C, Hotel Chelsea

THURSDAY, 9:30 A.M.

DENTAL HEALTH SECTION AND THE AMERICAN SCHOOL HEALTH ASSOCIATION

Joint Session—Room C, Convention Hall

Presiding: LESTER A. GERLACH, D.D.S., and CYRUS H. MAXWELL, M.D.

Materials and Methods in Dental Health Teaching in Schools. MARY BOWEN.

The Educational Approach of the School Dental Hygienist. MARGARET JEFFREYS.

The Provision of Dental Care by the School and by the Family Dentist. E. HORACE JONES, D.D.S.

The Part of the State Health Department in the School Dental Program. J. M. WISAN, D.D.S.

Dental Health Education Services of the American Dental Association. GLENNA G. WALTER.

THURSDAY, 9:30 A.M.

FOOD AND NUTRITION SECTION

Second Session—Room B, Convention Hall

METHODS FOR APPRAISAL OF NUTRITIONAL STATUS

Experiences in Appraising Nutritional Status in the U. S. Public Health Service. HAROLD R. SANDSTEAD, M.D.

Microchemical Procedures and Their Use in the Investigation of Problems in Nutrition. ROBERT E. SHANK, M.D.

Appraising the Nutritional Status of Mothers and Infants. CLEMENT SMITH, M.D., and HAROLD STUART, M.D.

Experiences in New York City Nutrition Clinics. NORMAN JOLLIFFE, M.D.

INDUSTRIAL HYGIENE AND ENGINEERING SECTIONS

Joint Session—Room D, Convention Hall

Presiding: HELMUTH H. SCHRENK, PH.D., and W. SCOTT JOHNSON.

GENERAL ATMOSPHERIC POLLUTION

Panel Leader: (To be announced.)

Participants:

JOHN BUXELL.
H. G. DYKTOR.
CHARLES L. SENN.
ARTHUR C. STERN.

EPIDEMIOLOGY, HEALTH OFFICERS, LABORATORY, MATERNAL AND CHILD HEALTH, AND SCHOOL HEALTH SECTIONS

Joint Session—Ballroom, Convention Hall

Presiding: JAMES E. PERKINS, M.D., RICHARD F. BOYD, M.D., SARA E. BRANHAM, M.D., VIKTOR O. WILSON, M.D., and GEORGE M. WHEATLEY, M.D.

CURRENT STATUS OF IMMUNIZATION PROCEDURES

Smallpox. RALPH S. MUCKENFUSS, M.D.

Influenza. THOMAS FRANCIS, JR., M.D.

Pertussis. JOSEPH A. BELL, M.D.

Tuberculosis. HERMAN E. HILLEBOE, M.D.

Typhoid Fever. COLONEL RUFUS L. HOLT, M.C.

Diphtheria. DONALD T. FRASER, M.B., D.P.H.

Tetanus and Exotic Diseases of Military Importance. ARTHUR P. LONG, M.D.

Practical Aspects of Immunization Programs. FRANKLIN H. TOP, M.D.

THURSDAY, 9:30 A.M.

PUBLIC HEALTH EDUCATION

Second Session—Rooms 1, 2, 3, 4, 5, 6, 10, Convention Hall

Meetings of all Regional Committees.

PUBLIC HEALTH EDUCATION NEEDS AND PROBLEMS OF THE REGIONS.

Committee on Public Health Education Problems in the Far West Region. *Chairman,* HOWARD W. LUNDY, DR.P.H. *Room 1.*

Committee on Public Health Education Problems in Latin America. *Chairman,* PHILIP L. RILEY. *Room 2*

Committee on Public Health Education Problems in the Middle States Region. *Chairman,* HUGH MASTERS. *Room 3.*

Committee on Public Health Education Problems in the Northeastern Region. *Chairman,* HOMER N. CALVER. *Room 4.*

Committee on Public Health Education Problems in the Northwestern Region. *Chairman,* EDNA GERKEN. *Room 5.*

Committee on Public Health Education Problems in the Southeastern Region. *Chairman,* HELEN A. MARTIKAINEN. *Room 6.*

Committee on Public Health Education Problems in the Southwestern Region. *Chairman,* OPAL HARTLINE, Ph.D. *Room 10.*

VITAL STATISTICS

Second Session—Room A, Convention Hall

BASIC TRAINING FOR VITAL STATISTICS

Panel Leader: C.-E. A. WINSLOW, DR.P.H.

Participants:

The Teacher. MARGARET MERRELL, SC.D.

The Health Officer. HUNTINGTON WILLIAMS, M.D.

The Public Health Nurse. MARION W. SHEAHAN, R.N.

The Health Educator. LAURENCE T. ROGERS, PH.D.

The Registrar. ARTHUR W. HEDRICH, SC.D.

The Statistician. RUTH R. PUFFER, DR.P.H.

Section Business.

THURSDAY, 12:30 P.M.

ENVIRONMENTAL SANITATION INSTRUCTORS

Luncheon Session—Rooms 110-111, Hotel Ambassador

Open to instructors on faculties giving instruction in environmental sanitation

THURSDAY, 2:30 P.M.

SECOND SPECIAL SESSION

Ballroom, Convention Hall

Presiding: HARRY S. MUSTARD, M.D.

THE HERITAGE OF THE PAST—THE SEED OF THE FUTURE TOMORROW

The Unfinished Job of Essential Public Health Service. HAVEN EMERSON, M.D.

New Problems in the Field of Medical Care. THOMAS PARRAN, M.D.

Social and Economic Factors in Disease. C.-E. A. WINSLOW, DR.PH.

Public Health and the Future. RAYMOND B. FOSDICK, LL.D.

LABORATORY

Second Session—Room B, Convention Hall

SOME PRESENT-DAY ASPECTS OF PUBLIC HEALTH LABORATORY WORK

A Modified Test for Occult Blood Eliminating and False Reactions Due to Iron Salts. NICHOLAS M. MOLNAR.

The Cell Smear Methods of Diagnosing Cancer. GEORGE N. PAPANICOLAOU, M.D.

Is the Rh Factor a Public Health Laboratory Problem? ANNA I. VANSAUN.

Blood Grouping and Rh Typing in a State Public Health Laboratory. ROBERT A. MACCREADY, M.D., and ROBERT T. MCGEE.

The Production of the Rh Typing Serums. LOUIS K. DIAMOND, M.D.

A Report on the Field Use of Chick Membrane Culture Smallpox Vaccine in Texas. E. B. M. COOK, PATTI N. CRAIN, and J. V. IRONS, SC.D.

Heat Resistance Studies with Spores of Bacillus anthracis and Related Mesophilic Aerobic Bacilli in Liquid Substrates and in Hair and Bristles. ROY SCHNEITER, PH.D., and ROBERT W. KOLB.

Universal Serologic Reaction in Lepromatous Leprosy. REUBEN L. KAHN, SC.D., BETTY J. BARIBEAU, and FLORA T. VILLALON, M.D.

THURSDAY, 7:00 P.M.

SECOND GENERAL SESSION

Annual Banquet—Wedgewood Room, Hotel Chelsea

Presiding: HARRY S. MUSTARD, M.D., *President*, American Public Health Association.

Presentation of Forty Year Membership Certificates.

Announcement of New Officers, Resolutions.

Presentation of the Lasker Awards for 1947.

Dancing. Refreshments. Informal.

FRIDAY, 9:30 A.M.

ENGINEERING SECTION

Second Session—Room C, Convention Hall

Opportunities for the Engineer in Public Health. ROBERT N. CLARK.

Sanitary Engineering in the Design of Hospital Facilities. A. H. WIETERS.

Public Health and Sanitation Problems Arising in Connection with the Public Housing Program. ARTHUR E. GORMAN.

Graduate Training of Engineers in Public Health. JOHN M. HENDERSON.

Inservice Training for Sanitarians in Local and State Health Departments. JOHN BUXELL.

Two Years of Organized County-wide House-to-House Sanitation and Insect Control with DDT. J. A. WILLMAN.

Program of Training Local Sanitary Field Workers in the Amazon. EMIL T. CHANLETT and EDMUND G. WAGNER.

Committee Reports:

Committee on Industrial Sanitation. *Chairman,* HERBERT M. BOSCH.

Committee on Rural Sewage Disposal. *Chairman,* WILLIAM T. INGRAM.

Committee on School Sanitation. *Chairman,* HERBERT J. DUNSMORE.

EPIDEMIOLOGY

Third Session—Room 20, Convention Hall

Epidemiology of Colorado Tick Fever. LLOYD FLORIO, M.D.

Comparative Epidemiology of Poliomyelitis in Certain California Cities. W. MCDOWELL HAMMON, M.D.

Death Defect and Disability in Prenatal Life: An Epidemiologic Consideration. THEODORE H. INGALLS, M.D., and JOHN E. GORDON, M.D.

Pertussis Immunization with an Alum-Precipitated Mixture of Diphtheria Toxoid and Pertussis Vaccine. JOSEPH A. BELL, M.D.

Reactions Accompanying the Use of Influenza Virus Vaccines. JONAS E. SALK, M.D.

HEALTH OFFICERS

Third Session—Room A, Convention Hall

HOSPITAL RELATIONS

The Hospital as an Instrument in a Public Health Program. VANE HOGE, M.D.

Hospital Program of New York State. JOHN BOURKE, M.D.

Hospital Services in Saskatchewan. FREDERICK D. MOTT, M.D.

Hospital Program in Indiana. L. E. BURNEY, M.D.

Hospital and Health Center Program in Latin America. RICHARD J. PLUNKETT, M.D.

FRIDAY, 9:30 A.M.

LABORATORY SECTION AND CONFERENCE OF STATE AND PROVINCIAL PUBLIC HEALTH LABORATORY DIRECTORS

Joint Session—Ballroom, Convention Hall

Presiding: SARA E. BRANHAM, M.D., and MYRTLE GREENFIELD.

Program to be announced.

PUBLIC HEALTH EDUCATION

Third Session—Room D, Convention Hall.

Presiding: ANN W. HAYNES, *Vice-Chairman.*

Canada Sees New Horizons of Health Education. LT. COLONEL C. W. GILCHRIST.

Research and Educational Objectives in Combating Leprosy. COLONEL G. H. RAREY.

Recent Research Studies in Alcoholism. JOSEPH HIRSH.

Volunteers Under Professional Direction for Community Health. RAYMOND G. NEBELUNG, DR.P.H.

SCHOOL HEALTH

Second Session—Room B, Convention Hall

COMMUNITY RESOURCES FOR HEALTH EDUCATION—HOW WELL ARE THEY BEING UTILIZED IN THE SCHOOL PROGRAM?

Discussants:

A School Administrator. RAYMOND L. COLLINS.

A Health Officer. GEORGE JAMES, M.D.

A Voluntary Agency Health Educator. BERYL J. ROBERTS.

A Teacher Educator. W. C. MASON, M.D.

A Classroom Teacher. MABEL STUDEBAKER.

PUBLIC HEALTH VETERINARIANS

Room 21, Convention Hall

FRIDAY, 12:30 P.M.

MEETING OF ALL SECTION COUNCILS WITH THE EDITORIAL BOARD

Luncheon Session—Venetian Room, Hotel Ambassador

CONFERENCE OF STATE AND PROVINCIAL PUBLIC HEALTH LABORATORY DIRECTORS

Luncheon Session—Como Hall, Hotel Chelsea

FRIDAY, 2:30 P.M.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC HEALTH LABORATORY DIRECTORS

2:30 P.M., Renaissance Room, Hotel Ambassador

6:30 P.M., Dinner Session, Venetian Room, Hotel Ambassador

SATURDAY, 9:30 A.M.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC HEALTH LABORATORY DIRECTORS

Venetian Room, Hotel Ambassador

ASSOCIATION NEWS

SPEAKERS AT WESTERN BRANCH A.P.H.A. ANNUAL MEETING DECORATED BY HAWAIIAN GROUP

At the meeting of the Western Branch American Public Health Association held in San Francisco, Calif., the Hawaiian delegation brought fresh leis by air from Honolulu for the officers and speakers at the Branch meeting. These were presented at the Banquet Session on May 27.

Left to right: Miss Laura A. Draper; Karl F. Meyer, Ph.D., President, Western Branch; Florence Sabin, M.D., President-Elect, Western Branch; Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.; Thomas Parran, M.D., Surgeon General, U.S.P.H.S.; and V. Mary Crosse, M.D., Senior Medical Officer from Maternal and Child Welfare, Birmingham, England.

SOUTHERN AND WESTERN BRANCH A.P.H.A. MEETINGS FIXED FOR 1948

The officers of the Southern Branch American Public Health Association of which John M. Whitney, M.D., New Orleans, La., is Secretary-Treasurer, have announced that the 1948 meeting of the Southern Branch will be held in New Orleans beginning April 12 at the Roosevelt Hotel. Particular attention is called to this date because of the desire to avoid conflicts with other meetings in the territory of the Branch.

The officers of the Western Branch A.P.H.A. of which Walter Mangold of Berkeley, Calif., is Secretary, have announced that the 1948 meeting of the Western Branch will be held in Salt Lake City, Utah, the last week of May. Requests have been received for the organization of a team of speakers to

attend state meetings before and after the dates of the Western Branch.

The Executive Board of the American Public Health Association has expressed itself as eager to serve the Branches and the state public health associations, especially those affiliated with the A.P.H.A., in connection with their annual meetings. It is recognized that much more help can be offered when these meetings are related to the dates of the Branch sessions. The Board has directed that priority should be given in 1948 to requests which may be received from affiliated societies in the territory of the Southern Branch. In case there should be a desire on the part of these associations to set their dates in a consecutive pattern which would make it possible to utilize a group of speakers selected on a national or perhaps an international basis, the A.P.H.A. office will welcome communications from the officers of Affiliated Societies and other state associations wishing to participate in 1948 plans.

APPLICANTS FOR FELLOWSHIP

In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place during the Atlantic City Annual Meeting.

Health Officers Section

Solomon J. Axelrod, M.D., Senior Surgeon (R); Chief, Health Services Division, Labor Branch, U. S. Dept. of Agriculture, Washington, D. C.

Asa Barnes, M.D., M.P.H., Pacific Area Medical Director, American Red Cross, San Francisco, Calif.

Daniel C. Barrett, M.D., M.P.H., Medical Director, Southeastern Branch Office, State Board of Health, Columbus, Ind.

Major Philip E. M. Bourland, M.C. (M.D., M.S.P.H.), Chief, Preventive Medicine Division, Public Health and Welfare Section, GHQ, SCAP, Tokyo, A.P.O., San Francisco, Calif.

John M. Chapman, M.D., M.P.H., Assistant Director, Bureau of Medical Services, City Health Dept., Los Angeles, Calif.

Leland H. Dame, M.D., Director, Orange County Health Dept., Orlando, Fla.

Erwin C. Drescher, M.D., M.P.H., Commissioned Officer, U. S. Public Health Service, New York, N. Y.

Harry S. Fein, M.D., M.S.P.H., Postgraduate Student (Conservation of Hearing), Dept. of Otolaryngology, University of Illinois College of Medicine, Chicago, Ill.

F. Kenneth Gates, M.D., District Health Officer, Los Angeles County Health Dept., Alhambra, Calif.

Frank M. Hall, M.D., M.P.H., Director, State Board of Health Training Center, Gainsville, Fla.

M. Flint Haralson, M.D., Medical Director, U. S. Public Health Service, Baltimore, Md.

Andrew Hedmeg, M.D., M.P.H., Health Officer, Harrison County Health Dept. Gulfport, Miss.

Gerald A. Heidbreder, M.D., M.P.H., Chief, Division of Venereal Disease Control, Los Angeles County Health Dept., Los Angeles, Calif.

Chester A. Hicks, M.D., Dr.P.H., Director of Public Health, New Rochelle, N. Y.

Robert M. Hursh, M.D., Director, Bureau of Health, Harrisburg, Pa.

Edwin H. Jorris, M.D., M.S.P.H., Assistant State Health Officer, Madison, Wis.

Richard A. Koch, M.D., M.P.H., Chief, Division of Venereal Disease, City Health Dept., San Francisco, Calif.

Richard K. C. Lee, M.D., Dr.P.H., Assistant Health Executive, Territorial Board of Health, Honolulu, T. H.

Fred P. Long, M.D., M.S.P.H., Director, Division of Preventable Disease Control, State Dept. of Health, Lincoln, Neb.

Fred Mayes, M.D., Assistant State Health Officer and Director of Local Health Administration, State Board of Health, Topeka, Kan.

Marshall W. Meyer, M.D., M.P.H., Venereal Disease Control Officer, State Board of Health, Madison, Wis.

Guy R. Post, M.D., M.P.H., Director, Crippled Children's Service, State Dept. of Education, Jackson, Miss.

Milton I. Roemer, M.D., M.P.H., Associate in Medical Care Administration, States Re-

lations Division, U. S. Public Health Service, Washington, D. C.

Ralph F. Sikes, M.D., M.P.H., Health Officer, Norwalk Conn.

Charles M. Smith, M.D., Member, State Board of Health, and Health Officer, Provo, Utah

Jess B. Spielholz, M.D., M.S.P.H., Head, Cancer Control Section, State Dept. of Health, Seattle, Wash.

George C. Stucky, M.D., Director, Eaton County Health Dept., Charlotte, Mich.

William J. Sullivan, M.D., M.P.H., Acting Assistant Chief, Surgical Division, Veterans' Administration, Washington, D. C.

Vernon A. Turner, M.D., M.P.H., Assistant Director, Bureau of Local Health Services, State Dept. of Health, Abingdon, Va.

William R. Willard, M.D., Dr.P.H., Assistant Professor of Public Health, Yale University Medical School, New Haven, Conn.

Charles L. Williams, Jr., M.D., M.P.H., Surgeon, U. S. Public Health Service, Washington, D. C.

Frank E. Wilson, M.D., M.P.H., Deputy National Medical Director, American National Red Cross, Washington, D. C.

Vernon M. Winkle, M.D., M.P.H., Assistant Director of Local Health Service, State Board of Health, Topeka, Kan.

James E. Wolfe, M.D., Director of Public Health, Wichita, Kan.

Rhea L. Wyatt, M.D., M.P.H., Director, Alcorn County Health Dept., Corinth, Miss.

Laboratory Section

Howard L. Bodily, Ph.D., Assistant Chief, Division of Laboratories, State Dept. of Public Health, Berkeley, Calif.

Michael A. Farrell, Ph.D., Professor and Head, Dept. of Bacteriology, Pennsylvania State College, State College, Pa.

George E. Foley, Assistant Bacteriologist, Massachusetts General Hospital, Boston, Mass.

Louis P. Gebhardt, M.D., Ph.D., Professor and Acting Head, Dept. of Bacteriology, University of Utah Medical School, Salt Lake City, Utah

Albert V. Hardy, M.D., Dr.P.H., Director of Laboratories, State Board of Health, Jacksonville, Fla.

Joseph Lebowich, M.D., Director, Saratoga County Laboratory, Saratoga Springs, N. Y.

Lt. Col. Arthur P. Long, M.C. (M.D., Dr. P.H.), Infectious Disease Control, Preventive Medicine Division, U. S. Army, Washington, D. C.

Loren D. Moore, M.D., Assistant Director, Division of Biologic Laboratories, State Dept. of Health, Jamaica Plain, Mass.

Elizabeth I. Parsons, Sc.D., Assistant Professor, Dept. of Bacteriology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md.

Vital Statistics Section

Robert D. Grove, Ph.D., Senior Social Science Analyst, National Office of Vital Statistics, Washington, D. C.

Martha C. Jones, B.A., Statistical Field Consultant, National Tuberculosis Association, New York, N. Y.

Herbert H. Marks, A.B., Manager, Insurance Medical Statistics, Metropolitan Life Insurance Co., New York, N. Y.

Elizabeth H. Pitney, Ph.D., Biostatistician, National Office of Vital Statistics, Washington, D. C.

Christopher Tietze, M.D., Statistical Director, Italian Studies, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md.

Edward S. Weiss, M.S.P.H., Biometrician, Tuberculosis Control Division, U. S. Public Health Service, Washington, D. C.

Theodore D. Woolsey, A.B., Biostatistician, Public Health Methods Division, U. S. Public Health Service, Washington, D. C.

Engineering Section

Frederick F. Aldridge, S.M., Chief, Sanitary Engineering Branch, UNRRA, Washington, D. C.

Edward S. Hopkins, B.S., Filtration Engineer, Bureau of Water Supply, Baltimore, Md.

Robert S. Ingols, Ph.D., Research Associate Professor, Georgia School of Technology, Atlanta, Ga.

Benn J. Leland, M.S., Chief Sanitary Engineer, Cook County Dept. of Public Health, Chicago, Ill.

George W. Marx, C.E., Director, Division of Sanitary Engineering, State Dept. of Health, Phoenix, Ariz.

Herbert Moore, C.E., M.S., Consulting Engineer, Milwaukee, Wis.

Louis W. Pickles, C.E., M.P.H., Director, Division of Sanitation, St. Louis County Health Dept., Clayton, Mo.

Joseph A. Salvato, Jr., M.C.E., District Sanitary Engineer, State Dept. of Health, Poughkeepsie, N. Y.

Perry C. Sharp, B.S.C.E., Sanitary Engineer, Wyandotte County Health Dept., Kansas City, Kan.

Earle W. Sudderth, B.S., Sanitary Engineer, Dallas County Health Dept., Dallas, Tex.

E. Carl Warkentin, M.S., Sanitary Engineer, State Dept. of Health, Oklahoma City, Okla.

Charles T. Wright, B.S.S.E., Senior Sanitary Engineer, U. S. Public Health Service, Denver, Colo.

Industrial Hygiene Section

Marcos Charnes, M.D., M.P.H., Member of Section in Charge of Industrial Hygiene, International Labor Office, Montreal, Que., Canada

Richard D. Mudd, M.D., Ph.D., Medical Director, Chevrolet-Grey Iron Foundry, General Motors Corp., Saginaw, Mich.

Robert T. Pring, B.S.Ch.E., Director, Industrial Hygiene Dept., Kennecott Copper Corp., Garfield, Utah

Food and Nutrition Section

Walter Wilkins, M.D., Ph.D., Director of Nutrition Investigations and Services, State Board of Health, Jacksonville, Fla.

Maternal and Child Health Section

Katherine Bain, M.D., Director, Division of Research in Child Development, Children's Bureau, Washington, D. C.

Caroline A. Chandler, M.D., Assistant Professor of Preventive Medicine, Johns Hopkins University School of Medicine, Baltimore, Md.

Edward Davens, M.D., Chief, Bureau of Child Hygiene, State Dept. of Health, Baltimore, Md.

Hans Meyer, M.D., Senior Assistant Physician in Charge of Feebleminded Division, Crownsville State Hospital, Crownsville, Md.

Ruth A. Parmelee, M.D., M.P.H., Medical Adviser, Near East Foundation, Athens, Greece

Dean W. Roberts, M.D., Chief, Bureau of Medical Services, State Dept. of Health, Baltimore, Md.

Edward R. Schlesinger, M.D., M.P.H., Acting Director of Maternal and Child Health, State Dept. of Health, Albany, N. Y.

Stuart S. Stevenson, M.D., M.P.H., Associate in Child Health, Harvard University School of Public Health, Boston, Mass.

Public Health Education Section

Vivian V. Drenckhahn, M.S., C.P.H., Associate in Health Education, National Tuberculosis Association, New York, N. Y.

Thomas D. Fitzgerald, M.D., M.S.P.H., Professor of Health Education and Director of Student Health, Illinois State Normal University, Normal, Ill.

Ruth J. Cramer Frantz, R.N., M.P.H., Director of Health Education, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.

John L. C. Goffin, M.D., Supervisor of Health Education, Board of Education, Los Angeles, Calif.

Opal C. Hartline, Ph.D., M.P.H., Director of Health Education, City-County Health Unit, El Paso, Tex.

Joseph Hirsh, M.A., Associate Director in Charge of Education, Research Council on Problems of Alcohol, New York, N. Y.

Milton E. Kossack, M.S.P.H., Director of Health Education, City Health Dept., New Orleans, La.

Elna I. Perkins, M.S., Executive Secretary, Greenwich Tuberculosis and Health Association, Greenwich, Conn.

Stella Randolph, M.A., Director of Health Education, Montgomery County Health Dept., Rockville, Md.

Ruth Sumner, Ph.D., M.S.P.H., Director, Division of Health Education and Training Officer in Health Education, Savannah-Chatham County Health Dept., Savannah, Ga.

Theda L. Waterman, B.S., C.P.H., Consultant in Health Education, Tuberculosis Institute of Chicago and Cook County, Chicago, Ill.

Harold M. Williams, M.D., Assistant Secretary-Editor, State Medical Association of Texas, Fort Worth, Tex.

Laura B. Wilson, R.N., Health Counselor, Dormont Board of Education, Pittsburgh, Pa.

Public Health Nursing Section

Hazel E. Altmann, R.N., B.S.Ed., Supervising Nurse, City Health Dept., Jackson, Mich.

Sybil P. Bellos, R.N., Director, Greenwich Town Nursing Service, Greenwich, Conn.

Irene Carn, R.N., A.M., Associate Chairman, Dept. of Nursing, Skidmore College and New York Post-Graduate Hospital, New York, N. Y.

Clara M. Chitwood, R.N., B.S., District Supervising Nurse, State Dept. of Health, Gouverneur, N. Y.

L. Ann Conley, R.N., M.P.H., Assistant Professor of Nursing, Wayne University, Detroit, Mich.

Winona E. Darrah, R.N., M.A., Director of Health and Welfare, Monmouth County Organization for Social Service, Red Bank, N. J.

M. Olwen Davies, R.N., M.A., Instructor and Assistant Professor of Nursing, University of California, San Francisco, Calif.

Helen F. Dunn, B.S., Director of Public Health Nursing, State Dept. of Health and Welfare, Augusta, Me.

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Clarissa Gibson, M.A., Director, Visiting Nurse Association of Scranton and Lackawanna County, Scranton, Pa.

Portia Irick, R.N., B.S., Director of Nursing Services, American Red Cross, San Francisco, Calif.

Martha R. Jenny, R.N., M.S., Associate Professor of Public Health Nursing, University of Wisconsin, Madison, Wis.

Lillian J. Johnston, R.N., B.S., Consultant Public Health Nurse, Division of Communicable Diseases, State Dept. of Health, Albany, N. Y.

Mildred C. Lant, M.A., Public Health Nurse, Brooklyn Visiting Nurse Association, Brooklyn, N. Y.

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Janice E. Mickey, R.N., M.S., Assistant Professor, School of Public Health, University of Minnesota, Minneapolis, Minn.

Mary C. Mulvany, R.N., M.A., Dean, School of Nursing Education, St. John's University, Brooklyn, N. Y.

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Madeline Roessler, R.N., M.A., Director of Nurses, Cook County Dept. of Public Health, Chicago, Ill.

Mathilda Scheuer, Educational Director, Visiting Nurse Society, Philadelphia, Pa.

Julia D. Smith, R.N., M.A., Director, Instructive Visiting Nurse Association, Richmond, Va.

Janet F. Walker, M.S., Assistant Professor in Nursing Education, Catholic University, Washington, D. C.

Patricia M. Walsh, R.N., M.A., Instructor in Public Health Nursing, School of Public Health, University of Michigan, Ann Arbor, Mich.

Ruth B. Wood, R.N., M.A., Executive Director, Visiting Nurse Association, Newark, N. J.

Epidemiology Section

Lester Breslow, M.D., M.P.H., Chief, Chronic Disease Service, State Dept. of Public Health, San Francisco, Calif.

Arthur C. Curtis, M.D., M.P.H., Director, Division of Tuberculosis Control, State Health Dept., Little Rock, Ark.

Theodore S. Drachman, M.D., M.S.P.H., Deputy Commissioner, Westchester County Dept. of Health, Peekskill, N. Y.

Arthur B. Robins, M.D., Dr.P.H., Supervisor of Clinics, City Dept. of Health, New York, N. Y.

A. Daniel Rubenstein, M.D., M.P.H., District Health Officer, North Metropolitan District, State Dept. of Health, Brighton, Mass.

Robert L. Simmons, M.D., M.P.H., Associate Professor and Head, Dept. of Preventive Medicine and Public Health, Louisiana State University School of Medicine, New Orleans, La.

Hugh H. Smith, M.D., M.P.H., Assistant Director, International Health Division, Rockefeller Foundation, New York, N. Y.

Capt. Van C. Tipton, M.C. (M.D., M.P.H.), Officer in Charge, Epidemiology Branch, Bureau of Medicine and Surgery, Navy Dept., Washington, D. C.

School Health Section

William J. Dougherty, M.D., Medical Inspector of Schools and Board of Health Physician, Frackville, Pa.

Dorothy B. Nyswander, Ph.D., Professor of Health Education, School of Public Health, University of California, Berkeley, Calif.

John H. Shaw, Ed.D., Chairman, Division of Teacher Training for Men, Syracuse University, Syracuse, N. Y.

Warren H. Southworth, Dr.P.H., M.A., Associate Professor of Education, University of Wisconsin, Madison, Wis.

Dental Health Section

Margaret H. Jeffreys, M.P.H., Supervisor of Oral Hygiene and Associate in Health Education, State Dept. of Health, Dover, Del.

William H. Rumbel, D.D.S., Director, Bureau of Dental Hygiene, State Dept. of Health, Charleston, W. Va.

Unaffiliated

Ludwik Anigstein, M.D., Ph.D., Professor of Preventive Medicine and Public Health and Associate Professor of Tropical Medicine, University of Texas Medical Branch, Galveston, Tex.

Fred C. Bishopp, Ph.D., Assistant Chief in Charge of Research, Bureau of Entomology

and Plant Quarantine, U. S. Dept. of Agriculture, Washington, D. C.

Murray C. Brown, M.D., Director of Medical Education and Professor of Medicine, Meharry Medical College, Nashville, Tenn.

C. Walter Clarke, M.B., M.A., Executive Director, American Social Hygiene Association, New York, N. Y.

Frank J. Condon, M.D., M.P.H., Senior Surgeon (R), U. S. Public Health Service; Executive Medical Officer, Office of Indian Affairs, Albuquerque, N. M.

A. Barklie Coulter, M.D., Director, Bureau for Tuberculosis, Health Dept., Washington, D. C.

Lyman C. Duryea, M.D., M.P.H., Medical Director, Research Council on Problems of Alcohol, New York, N. Y.

Oscar Felsenfeld, M.D., C.P.H., Research Bacteriologist, Mt. Sinai Medical Research Foundation, Chicago, Ill.

Franz Goldmann, M.D., Associate Professor, Harvard University School of Public Health, Boston, Mass.

Clarence F. W. Hames, M.D., D.P.H., Deputy Minister, Department of Public Health, Regina, Sask., Canada

John V. Killion, D.D.S., M.P.H., Public Health Dentist, Dept. of Health, Philadelphia, Pa.

Irwin I. Lubowe, M.D., Medical Inspector, Bureau of Social Hygiene, City Dept. of Health, New York, N. Y.

Henry B. Makover, M.D., Associate Director, Montefiore Hospital, New York, N. Y.

Herbert Notkin, M.D., M.P.H., Medical Consultant, State Dept. of Vocational Rehabilitation, Sacramento, Calif.

John J. Ritter, Lt. Col., M.A.C., (Ret.), Assistant Administrator, Fordham Hospital, New York, N. Y.

Gordon H. Seger, Dr.P.H., Chief, State Personnel Administration Unit, U. S. Public Health Service, Washington, D. C.

Caroline R. Shreve, Director, Atlantic County Public Health Service, Atlantic City, N. J.

Henry Simon, M.D., M.P.H., Epidemiologist, Health Dept., Newark, N. J.

Norman D. Thetford, M.D., Chief Municipal Physician and Asst. Commissioner of Health, Christiansted, Saint Croix, Virgin Islands

Percy T. Watson, M.D., M.P.H., Director of Local Health Services, State Dept. of Health, St. Paul, Minn.

Lillian Wurzel, M.A., Medical Social Worker, Los Angeles Tuberculosis Sanatorium, Duarte, Calif.

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association, October 6–10, 1947

NOTE: Single rooms are very limited in number. Please arrange to occupy twin-bedded rooms.

HOUSING BUREAU, 16 Central Pier, Atlantic City, N. J.

Please reserve the following:

Hotel..... First Choice Hotel..... Fourth Choice

Hotel..... Second Choice Hotel..... Fifth Choice

Hotel..... Third Choice Hotel..... Sixth Choice

..... Room(s) with bath for ..... person(s). Rate $..... to $..... per room.

Arriving Atlantic City....., hour ..... A.M. P.M. Leaving .....

NOTE: You will receive confirmation direct from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	Street Address	City	State

SEVENTY-FIFTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
ATLANTIC CITY, N. J., OCTOBER 6–10. 1947

HOTEL RATES, ATLANTIC CITY, N. J.

BOARDWALK HOTELS

Hotels		*Total Rooms*	*Rooms with Bath*	
			Single	*Double*
AMBASSADOR	Brighton Ave.	670	$6.00–$9.00	$9.00–$14.00
APOLLO	New York Ave.	51		8.00– 12.00
BREAKERS	New Jersey Ave.	475	4.00– 7.00	5.00– 12.00
BRIGHTON	Indiana Ave.	291	7.00–	9.00– 14.00
CHALFONTE-HADDON HALL	North Carolina Ave.	1,000	6.00–10.00	8.00– 18.00
CHELSEA	Morris Ave.	400	5.25– 6.75	6.75– 15.00
CLARIDGE	Park Pl.	406	6.00–14.00	9.00– 17.00
DENNIS	Michigan Ave.	475	6.00– 8.00	9.00– 14.00
MARLBOROUGH-BLENHEIM	Park Pl.	464	6.00–10.00	9.00– 16.00
MAYFLOWER	Tennessee Ave.	280	5.00– 6.00	7.00– 12.00
NEW BELMONT	S. Carolina Ave.	100	5.00– 6.00	7.00– 12.00
PRESIDENT	Albany Ave.	500	7.00–10.00	9.00– 15.00
RITZ-CARLTON	Iowa Ave.	431	6.00– 8.00	9.00– 14.00
ST. CHARLES	St. Charles Pl.	300	5.00–12.00	7.00– 14.00
SEASIDE	Pennsylvania Ave.	235	5.00–11.00	8.00– 14.00
SHELBURNE	Michigan Ave.	300	6.00– 9.00	9.00– 12.00
STRAND	Pennsylvania Ave.	271	4.50– 6.00	9.00– 12.00
TRAYMORE	Illinois Ave.	600	6.00–14.00	9.00– 18.00

AVENUE HOTELS

Hotels		*Total Rooms*	*Rooms with Bath*	
			Single	*Double*
BOSCOBEL	Kentucky Ave.	120		$8.00
CLARENDON	Virginia Ave.			7.00
COLTON MANOR	Pennsylvania Ave.	208	$5.00–$9.00	8.00–$12.00
COLUMBUS	Pacific Ave. at St. James	100		6.00
CRILLON ★	Pacific Ave. at Indiana	49		8.00– 10.00
EASTBOURNE	Pacific Ave. at Park	75		7.50– 8.00
FLANDERS	St. James Pl.	125	5.00	7.00– 9.00
FOX MANOR	Pacific Ave. at Belmont	60		8.00– 10.00
HOLMHURST	Pennsylvania Ave.	100		7.00– 8.00
JEFFERSON	Kentucky Ave.	150	6.00	7.00– 10.00
KENTUCKY	Kentucky Ave.	110	3.50	6.00– 7.00
LAFAYETTE	N. Carolina Ave.	100	5.00– 6.00	8.00– 10.00
MADISON	Illinois Ave.	210	4.50– 6.00	7.00– 10.00
MONTICELLO	Kentucky Ave.	175		7.00
MORTON	Virginia Ave.	300	5.00– 6.00	7.00– 9.00
PENN-ATLANTIC	S. Carolina Ave.	125		7.00
RUNNYMEDE	Park Pl.	75	4.00– 7.50	6.00– 10.00
SENATOR	S. Carolina Ave.	260	4.50– 7.00	7.00– 12.00
STERLING	Kentucky Ave.	83	4.00– 5.00	6.00– 7.00
VILLA D'ESTE	Pacific Ave. at Chelsea	40		8.00– 14.00

★ Rate Includes Breakfast

See Application Blank, preceding page

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the Sections indicated.

Health Officers Section

Clifford A. Bachrach, M.D., 670 East 18th St., Brooklyn 30, N. Y., Apprentice Epidemiologist, State Dept. of Health

David E. Block, M.D., North Road, Madalin, N. Y., Health Officer, Town of Red Hook

John M. Burnett, M.D., 507 Nanum, Ellensburg, Wash., Kittitas County Health Officer

Hsueh Chao-Sheng, M.D., Baltimore City Health Dept., Municipal Office Bldg., Baltimore, Md., Technical Expert, Ministry of Health, China

Edwin E. Corbett, 386 North Central Ave., Ramsey, N. J., Vice-President, Board of Health

Bernard J. Gioffre, M.D., 411 Westchester Ave., Port Chester, N. Y., Health Officer

Ellen Jiroudek, M.D., 33 Coddington Ave., Staten Island 6, N. Y., Health Officer-in-Training, New York City Dept. of Health

Alvin R. Leonard, M.D., M.P.H., 1240 Louisiana St., Vallejo, Calif., Medical Officer, State Dept. of Public Health

A. P. Merrill, M.D., 4422 Third Ave., New York 57, N. Y., Hospital Administrator, St. Barnabas Hospital for Chronic Diseases

C. Henry Murphy, M.D., Orpheum Bldg., Wichita, Kans., Director, Sedgwick County Dept. of Public Health

Donald J. Roop, M.D., Health Dept., Frederick, Md., Health Officer, State Dept. of Health

Andrew P. Sackett, M.D., 151 12th Ave., South Charleston, W. Va., Director, Bureau of Venereal Diseases, State Dept. of Health

Antonio Sobral de Cruz, M.D., Praca Batista Campos 145, Belem, Para, Brazil, S. A., Health Officer, Special Service of Public Health

Betty R. Berry, 5003 Hanna Place, S. E., Washington, D. C., Asst. Bacteriologist, Texas State Board of Health

Irving I. Cohen, 15 S. Gay St., Baltimore 2, Md., Chief Chemist, Straasburger and Siegel

June W. DeCelles, 4108-A West 61st St., Chicago, Ill., Senior Bacteriologist, Chicago Health Dept. Laboratory

Alvin L. Gleason, 410 N. First, Albuquerque, N. M., Senior Asst. Bacteriologist, Bernalillo County Health Dept.

Ruth E. Hollingsworth, Santa Maria Hospital, Santa Maria, Calif., Bacteriologist

Lt. Romey W. Keys, U. S. Public Health Service, American Legation, Monrovia, Liberia, Africa, X-Ray Technician

Annis E. Thomson, M.D., 34 East 51st St., New York 22, N. Y., Bacteriologist, Research Laboratory, City Dept. of Health

Louis F. Tomey, M.S., Route 1, Easton, Md., Assoc. Bacteriologist, Bureau of Labs., State Dept. of Health

Haskell S. Tubiash, M.S.P.H., U. S. Public Health Service, E. 3rd and Kilgour, Cincinnati, Ohio, Bacteriologist

Vital Statistics Section

Jacob Baar, M.A., 135 Remsen St., Brooklyn 2, N. Y., Editor, Statistical Bulletin, Metropolitan Life Insurance Co.

Etta Bloom, 105 Homestead St., Roxbury, Mass., Statistician, State Dept. of Public Health

Carl J. Heisser, Navy Dept., Potomac Annex Bldg. 5, Room 5, Washington, D. C., Statistician, Medical Statistics Division, Bureau of Medicine and Surgery

Louis Pincus, 451 Kingston Ave., Brooklyn 25, N. Y., Statistician, Bureau of Records and Statistics, City Dept. of Health

Jules V. Quint, 77-40 141st St., Flushing, N. Y., Accident Statistics Analyst, Statistical Bureau, Metropolitan Life Insurance Co.

Henry Schlichting, Jr., N.D., P. O. Box 968, Midland, Tex., Chief of Staff, Midland Naturopathic Clinic

Sam Shapiro, 1900 F. St., N. W., Washington, D. C., Biostatistician, National Office of Vital Statistics

Engineering Section

Richard Fenton, 479 Pennsylvania Ave., Brooklyn 7, N. Y., Health Inspector, Bureau of Sanitary Engineering, City Health Dept.

Joseph N. Lanoix, M.S., R. C. A. Communications, Port-au-Prince, Haiti, Chief Field Engineer, American Sanitary Mission, C. I. A. A.

Gerard A. Rohlich, Ph.D., University of Wisconsin, Hydraulic Lab., Madison, Wis., Assoc. Professor of Hydraulic and Sanitary Engineering

Industrial Hygiene Section

George A. L. Johnson, N. Y. Naval Shipyard, Bldg. 122, Brooklyn, N. Y., Industrial Hygienist, U. S. Navy

John L. Norris, M.D., C.M., Kodak Park, Rochester, N. Y., Asst. Supt., Medical Dept., Eastman Kodak Co.

Howard K. Sessions, Capt., M.C., 913 Hillwood Ave., Falls Church, Va., Officer in Command, Sanitation and Health Branch, Bureau of Medicine and Surgery, Navy Dept.

Robert C. Yeager, 100 East Court, Cincinnati 2, Ohio, Managing Partner, Rose Exterminator Co.

Food and Nutrition Section

Helen L. Gillum, Ph.D., 1575 Life Sciences Bldg., Berkeley 4, Calif., Assoc. Professor of Nutrition and Dietetics, Univ. of California

Gretchen J. Hartman, 2517 St. Paul, Baltimore, Md., Consultant Dietition, State Dept. of Health

Alexander V. Karmiloff, UNRRA, China Mission, Shanghai, China, Health Inspector

Lela A. Mackey, M.S., State Board of Health, Raleigh, N. C., Junior Nutritionist

Anne R. Matthews, M.P.H., 2517 St. Paul St., Baltimore, Md., Chief Nutritionist, State Dept. of Health

Concha Mendoza, Montefiore Hospital, Gun Hill Rd., New York 67, N. Y., Student Dietitian

Colonel Herbert K. Moore, V.C., Surgeons Office, Hqs., Army Ground Forces, APO 958, San Francisco, Calif., Veterinarian

Chloe A. Yates, Lee County Health Dept., Tupelo, Miss., Nutrition Consultant, State Board of Health

Maternal and Child Health Section

Dr. Ernesto Arango-Escobar, Direccion Municipal de Higiene, Medellin, Colombia, S. A., Director

Paul A. Harper, M.D., M.P.H., 615 N. Wolfe St., Baltimore, Md., Assoc. Professor, Dept. of Public Health Administration, Johns Hopkins School of Hygiene and Public Health

Robert E. Jewett, M.D., M.S.P.H., 1098 W. Michigan, Indianapolis 7, Ind., Director, Division of Maternal and Child Health, State Board of Health

Eileen E. Lester, 188 W. Randolph St., Room 2207, Chicago, Ill., Regional Medical Social Consultant, U. S. Children's Bureau

Public Health Education Section

Hilda Cloud, 1510 T-6, U. S. Public Health Service, Bethesda, Md., Scientific writer and Liaison Officer, Cancer Control

Walter I. Ettleman, 103½ W. Central Ave., Albuquerque, N. M., State Representative, National Foundation for Infantile Paralysis, Inc.

Marguerite M. Flynn, 4107 18th Ave., Brooklyn 18, N. Y., Staff Asst., Statistical Bureau, Metropolitan Life Insurance Co.

Elmer B. Gibson, 11 North Pearl St., Room 712, Albany, N. Y., Eastern New York State Representative, National Foundation for Infantile Paralysis, Inc.

Joseph A. Knight, M.S., 511 Exchange Ave., Endicott, N. Y., Student, School of Public Health, Columbia Univ.

Charles R. MacIvor, Life and Health, Takoma Park, Washington 12, D. C., Advertising Manager

Jean M. Martin, M.P.H., Dillard University, New Orleans, La., Asst. Professor of Nursing

Hazel O'Hara, 3626 Davis St., N. W., Washington 7, D. C., Information Specialist, Institute of Inter-American Affairs

W. Doyle Reed, 3609 Military Rd., N. W., Washington 15, D. C., Chief, Insect and Rodent Control Section, Office of Chief of Engineers, War Dept.

I. D. Robbins, Box 18, San Francisco, Calif., Interested Citizen

Rose Sherman, 1 Madison Ave., New York 10, N. Y., Director of Exhibits, Health and Welfare Division, Metropolitan Life Insurance Co.

Alice W. Smith, 3305 82nd St., Jackson Heights, N. Y., Public Health Research, Metropolitan Life Insurance Co.

Mrs. I. H. Teilman, 2110 Merced St., Selma, Calif., Chairman of Health, California Federation of Women's Clubs

Mayton O. Zickefoose, M.S., 2411 N. Charles St., Baltimore 18, Md., Asst. Nutritionist, State Dept. of Health

Public Health Nursing Section

Lois M. Bachmann, 30 Blodgett, Clarendon Hills, Ill., Staff Nurse, Cook County Dept. of Public Health

A. Evelyn Burke, M.A., 1008 Yale Ave., N., Seattle, Wash., Director of Public Health Nursing Education, King County Health Dept.

Jessie M. Dawson, R.N., 55 N. Elliott Place, Brooklyn 1, N. Y., Supervising Public Health Nurse, City Dept. of Health

Charlotte L. Decker, 54 Queen Anne Rd., Bogota, N. J., Educational Director, Visiting Nurse Assn. of the Oranges

Rose A. Godbout, R.N., Hidalgo County Health Unit, Edinburg, Tex., Director of Nurses

Eleanor J. Leckner, R.N., 4321 W. Broad-

way, Robbinsdale, Minn., Staff Nurse, Community Health Service

Mary Matthews, R.N., 2321 Canal, New Orleans, La., Asst. Nurse Officer, U. S. Public Health Service

Rita A. Nielsen, R.N., Winfield Hosptial, Winfield, Ill., Supt. of Nurses

Dorothy M. Percy, 66 Craig St., Ottawa, Canada, Chief Supervisor of Nurses, Civil Service Health Division, Dept. of National Health and Welfare

Ethel K. Prestrud, 814 Main St., Mount Vernon, Ill., Nursing Consultant, Division of Services for Crippled Children, Univ. of Illinois

Margaret A. Schwem, R.N., 109 S. 9th St., Olean, N. Y., Student, School of Public Health, Columbia Univ.

Anna M. Voelker, Colorado Bldg., Apt. 8, Beverly Park Gardens, Alexandria, Va., Exec. Director, Alexandria Visiting Nurse Service

Dorothy E. Watkins, P. O. Box 88, Point Pleasant, W. Va., Public Health Nurse, State Health Dept.

Epidemiology Section

Catherine H. Brewer, M.D., 808 Ocean Ave., Jersey City, N. J., Health Officer, State Dept. of Health

Philip K. Condit, M.D., 5555 Lawton Ave., Oakland 11, Calif., Epidemiologist, Oakland City Health Dept.

Robert J. Huebner, M.D., National Institute of Health, Bethesda, Md., Senior Asst. Surgeon, U. S. Public Health Service

Percy E. Moore, M.D., D.P.H., Dept. of National Health & Welfare, Ottawa, Ont., Canada, Director, Indian Health Services

Ottavio J. Pellitteri, 32-57 45th St., Astoria 3, N. Y., Epidemiologist, City Dept. of Health

Lillian Phillips, 22 Harrison St., Pittsburgh 5, Pa., Student, Univ. of Pittsburgh

Lt. Col. Harry J. Robertson, V.C., Medical Field Service School, Brooke AMC, Ft. Sam Houston, Tex., Acting Director, Dept. of Extension Courses, Brooke Army Medical Center

Nelson W. Strohm, M.D., 289 Linwood Ave., Buffalo, N. Y., Chief, Diagnostic Clinic, City Dept. of Health

School Health Section

Madison W. Foster, M.D., 1241 Desiard, Monroe, La., School Clinician, Grambling College

Florence M. Hellman, M.A., 132 Sherman, Kent, Ohio, Health Coordinator, Kent State Univ.

Marian H. Hosford, M.A., 1634 E. 7th St., Brooklyn 30, N. Y., School Health Educator, New York Tuberculosis and Health Assn.

Dorothy Lottridge, M.D., 1543 "O" St., Fresno, Calif., Medical Officer, State Dept. of Public Health

J. Robert Lyman, M.D., 24 Forest St., Wellesley Hills, Mass., School Physician, Town of Wellesley

Dental Health Section

Arthur Bushel, D.D.S., M.P.H., 39 Columbia St., Albany 7, N. Y., Senior Dentist, Dental Bureau, State Dept. of Health

Vernon J. Forney, D.D.S., M.P.H., 4604 S. Chelsea Lane, Bethesda, Md. 14, Chief Dental Section, Industrial Hygiene Division, U. S. Public Health Service

Dr. Esther Saavedra, 253 W. 24th St., New York, N. Y., Chief, Section of Odontology, Center of Hygiene, Servicio Cooperativo Inter-Americano de Salud Publica, Bogota, Colombia

Unaffiliated

Ralph C. Barnes, M.S., 605 Volunteer Bldg., Atlanta, Ga., Senior Asst. Scientist (Entomologist), U. S. Public Health Service

Deane F. Brooke, M.D., 3945 Connecticut Ave., Washington, D. C., Medical Consultant, U. S. Public Health Service

Charles W. A. Hammick, Council Chambers, Molesworth St., Lismore, N. S. W., Australia, Chief Health Inspector, Lismore City Council

Archie D. Hess, Ph.D., Tennessee Valley Authority, Wilson Dam, Ala., Chief, Biology Staff, Health and Safety Dept.

Elizabeth J. McEvoy, 27 Norton, Waterbury, Conn., Bacteriologist, Health Dept. Lab.

Sidney I. Wolfson, M.S.P.H., 29 McDermott St., Freehold, N. J., Field work with Nassau County Health Dept.

DECEASED MEMBERS

J. Cyril Eby, M.D., Plaquemine, La. Elected Member 1930, Health Officers Section

Leslie L. Lumsden, M.D., New Orleans, La., Elected Member 1909, Laboratory Section

Ira C. Miller, M.D., Camp Hill, Pa., Elected Member 1939, Epidemiology Section

Karel Charles Pur, M.D., Brno, Czechoslovakia, Elected Member 1947, Industrial Hygiene Section

Courtney Smith, M.D., Dr.P.H., Washington, D.C., Elected Member 1937, Elected Fellow 1942, Health Officers Section

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

POSITIONS AVAILABLE

(Supplemental to list in August Journal)

Trained **Laboratory Aids and Bacteriologists** needed in Wisconsin Civil Service. Three weeks' vacation with pay, sick leave, retirement benefits, permanency. Laboratory aids' salaries beginning at $155 and $180 a month. Bacteriologists at $190 a month. For further information write to the Bureau of Personnel, State Capitol, Madison 2, Wis.

Wisconsin Civil Service Vacancies: Medical specialists in public health II (tuberculosis control)—beginning monthly salary of $505. District health officers—beginning monthly salary of $430. Three weeks' vacation with pay, sick leave, retirement benefits, permanency. For further information write to the Bureau of Personnel, State Capitol, Madison 2, Wis.

Graduate in Bacteriology with some background in chemistry and experience in field of sewage and water research or treatment. To take charge of section in newly organized research project, Eastern United States. Salary $3,200–$4,200 depending upon qualifications. Write **Box L-535**, Employment Service, A.P.H.A.

Director of Nutrition for Red Cross Chapter in a midwestern metropolitan center. Candidate must have sound nutrition background and experience in community activity. Excellent opportunity to develop a broad program on a long-term basis with coöperation from health, education, social welfare, and business leaders. Salary open. Write **Box E-3**, Employment Service, A.P.H.A.

Positions are open in Georgia for county and district commissioners of health. Salaries for experienced public health physicians range from $6,600 to $7,500. Salaries for physicians with public health training who are entering the field range from $5,640 to $6,840. Liberal travel allowances supplement these salaries. Tenure of office is assured by a merit system. License to practise medicine in Georgia is required. Ample opportunities for training are offered with liberal stipend while in training. Write T. B. Abercrombie, M.D., Director, State Health Department, State Office Building, Atlanta 3, Ga., for application forms and full details.

1. **Sanitary Engineer** with training and experience. Maximum salary $4,200.
2. **Sanitarian** with experience in food and milk control, salary up to $3,000, for County Health Department, Southeast. County seat in large urban center. Write **Box E-516**, Employment Service, A.P.H.A.

Physician with experience or training in public health for Director of County health unit; headquarters in Bisbee, Ariz.; population 39,000; salary dependent upon training and experience; liberal flat rate for travel allowance. Apply Cochise County Health Service, Box 1193, Bisbee, Ariz.

School Physician for school district with a school population of more than 10,000. To take complete charge of the elementary program. Salary approximately $6,000. West Coast. Write **Box D-3**, Employment Service, A.P.H.A.

Sanitarian with experience in food handling and restaurant sanitation. Age 25 to 40 preferred. Health department experience necessary. Starting salary $3,000 plus ample travel allowance. Must be well educated and diplomatic. State education, experience, and age in reply. Must have own car. State of Wyoming. Write State Health Officer, Cheyenne, Wyo.

Physician for director of the health department medical services and to be assistant to the director of public health in one of the larger cities in Michigan. The work comprises supervision of child health conferences and school health programs, and communicable disease control including conduct of venereal disease clinics. Graduate from approved medical school with Michigan license. At least one year's public health training and experience preferred. Full-time position under merit system, opportunity for advancement. Vacation and sick leave and

travel allowances. Salary dependent on qualifications. Give full particulars in first letter and earliest date available. Write **Box J-2,** Employment Service, A.P.H.A.

1. **District Health Officers,** salary range from $5,160–$6,060 (including $30 per month cost of living bonus). Requirements: physician licensed to practise medicine in Wisconsin or eligible for license; under fifty years. The physicians selected under state Civil Service requirements would be eligible for an academic year of public health training at a generous stipend.

2. **Director of the Tuberculosis Control Division** (Medical Specialist in Public Health II). Salary $6,060–$7,260 (including $30 per month cost of living bonus). Requirements: physician, licensed to practise medicine in Wisconsin or eligible for license; degree from a recognized school of public health; three years' experience in the administration of public health activities. Special training and experience in the field of tuberculosis control desirable and may be substituted for the public health training and experience requirements. Write Wisconsin State Board of Health, Madison, Wis., for application blanks.

Physician for position in Michigan. Prefer pediatrician with training in public health, but will consider physician with public health training and experience in the field of maternal and child health. This is a special project and will be both interesting and stimulating. Salary $6,000 plus car allowance of 6¢ a mile. For further details contact Robert F. Hall, M.D., Director, Isabella County Health Department, Mt. Pleasant, Mich.

Director of School Health Program. Full-time physician, $6,000. To direct a County-wide program including Bethesda, Chevy Chase, Silver Spring, Tacoma Park, and other suburban and rural communities of Montgomery County adjacent to the District of Columbia. A challenging opportunity for a physician interested in a career in school health. Apply to County Health and Education Departments, Rockville, Md.

Experienced Laboratory Technician as chief technician of hospital laboratory, Northeast. College degree and several years' experience in bacteriology or chemistry. Military experience as laboratory officer highly regarded. Minimum starting salary $3,600. Write **Box L-537,** Employment Service, A.P.H.A.

1. **Senior Serologist.** Requirements: Bachelor's degree and one year graduate work in acceptable college or university, and two years' experience in same type of work.

2. **Senior Water and Milk Bacteriologist.** Requirements: Bachelor's degree with one year's graduate work in an acceptable college or university, and two years' experience in same type of work.

3. **Junior Biologist,** two. Requirements: Graduation from an acceptable college or university with major in biological subjects, preferably in bacteriology and serology. Address inquiries to C. F. Adams, M.D., State Division of Health, Jefferson City, Mo.

Health Commissioner for County of 40,000, Midwest. Possibility of including three cities located in the county in the County Unit. Salary open. Write **Box K-2,** Employment Service, A.P.H.A.

Physician as Director City-County Health Department, Eau Claire, Wis., population 56,000; staff of 14; ideal offices and laboratory. Salary for man with degree in public health $6,180 plus 6¢ per mile travel. Write Charles K. Kincaid, M.D., City-County Health Department, Safety Bldg., Eau Claire, Wis.

1. **District Health Officer.** Starting salary $4,800 plus $1,500 travel for personally owned car. Applicants over 45 years of age must have had previous experience in a full-time public health position.

2. **Venereal Disease Clinician.** Salary $4,500.

3. **Senior Bacteriologist-Serologist.** Salary $3,300.

4. **Senior Assistant Bacteriologist-Serologist.** Salary $2,400.

5. **Junior Bacteriologist-Serologist.** Salary $2,100. Positions are with the New Mexico Department of Public Health. For position requirements and application forms write: Merit System Supervisor, P. O. Box 939, Santa Fe, N. M.

Bacteriologist in state branch laboratory, State of Colorado. Required: college degree with specialization in bacteriology. No residence requirement. Beginning salary $2,400, advancement possible. Write Dr. R. L. Cleere, M.D., Executive Director, State Department of Public Health, 414 State Office Building, Denver, Colo.

Public Health Staff Nurses for generalized program under supervision. Salary range $225–$275. Liberal car allowance. Write: Public Health Nursing Section, Oregon State Board of Health, 1022 Southwest Eleventh Avenue, Portland 5, Ore.

Public **Health Nurses** with training and experience for county health departments in Virginia. Salary range $2,563 to $3,360 plus travel. Liberal vacation provisions. Write State Health Commissioner, State Office Building, Richmond 19, Va.

Nurses for Tuberculosis Sanatoria (white and Negro) in Virginia. Salary for supervisor $2,428, for general duty nurse $2,160. Write State Health Commissioner, State Office Building, Richmond 19, Va.

Director and Staff Nurses for generalized program in City and County of 105,000 population. Educational and cultural center including three colleges. Salaries based upon qualifications for staff nurses ranging from $2,900–$3,440, and for Director $3,500–$3,700 per year plus travel. Apply: Health Department, Kalamazoo, Mich.

Public Health Nurses for generalized nursing program. Vacancies exist for graduate nurses to be trained as Public Health Nurses. Salaries range from $2,644.80 to $3,397.20 (P-1 grade). Public Health Nurses' salaries range from $3,397.20 to 4,149.60 (P-2 grade). Write to Dr. George C. Ruhland, Health Officer, or Mrs. J. P. Prescott, Director, Bureau of Public Health Nursing, District of Columbia Department of Health, Washington, D. C.

Public Health Nurses, Baltimore County Health Department. Population 250,000; urban, suburban, and industrialized areas; county seat 8 miles from Baltimore. Generalized service; director, 4 supervisors, 25 field nurses. Immediate large expansion planned. Beginning salary $2,300 (for trainee) to $2,700, depending on experience and education. Opportunity for increases up to $3,300. Retirement plan; one month's vacation; 5 day, 35½ hour week sick leave. For use of personal car, allowance of 7 cents per mile. Write to Dr. William H. F. Warthen, Health Officer, Baltimore County Health Department, Towson 4, Md.

Staff Public Health Nurse for Department of Public Health, Oak Ridge, Tenn. Generalized Nursing Service for city of 35,000 population. Industry in connection with research and development of nuclear power. Minimum salary $2,709 per annum. Forty hour work week. Car furnished for all official work. Apply: Charles H. Benning, M.D., M.P.H., Director of Public Health, P. O. Box 486, Oak Ridge, Tenn.

Public Health Nurses with Certificate. Salary $230 per month; 40 hour week. Generalized program; opportunity for advancement. Write J. B. Eason, M.D., Director City Health Department, Spokane, Wash.

Two Public Health Nurses to teach in midwestern university. One responsible for certificate level program. One to develop program of study for graduate nurses preparing to integrate social and health aspects in basic schools of nursing. Must have Master's degree and a good combination of public health nursing experiences including supervision. Preference given to those with teaching experience. Beginning salary $4,000 for ten month contract. Write **Box N-398,** Employment Service, A.P.H.A.

Public Health Nurses for generalized program. Atomic energy project in State of Washington. Salary range $62.80 to $69.70 for forty hour work week. Automobiles furnished for work. Write Business Office, Kadlec Hospital, Richland, Wash.

Public Health Nurses are needed in Georgia: The State and County Departments of Public Health in Georgia invite qualified public health nurses to apply for permanent positions in Georgia. Staff nurses must have a minimum of six months' postgraduate public health nursing education in addition to acceptable basic training. Salaries range from $2,100 to $2,340 in addition to a liberal travel allowance. Supervisory nurses must have at least two years' experience in public health nursing as well as one academic year of postgraduate training in public health training in public health nursing. Salaries range from $2,400 to $3,000 in addition to travel allowances. Scholarships are available for graduate nurses who are interested in receiving public health nursing training. Write Personnel Administrator, State Health Department, State Office Building, Atlanta, Ga., for application forms and full details.

District Health Officers for the State of Washington. Requirements: Graduation from an approved medical school, one year interneship and 3 years in professional medical work; or 1 year in professional medical work and 1 year's study in school of public health. Salary $6,000 to $7,140. Exceptional candidates can start above the minimum level. Write State Personnel Board, Washington State Department of Health, Smith Tower, Seattle 4, Wash.

Assistant Chief Bacteriologist, Ph.D., with major in bacteriology and minor in chemistry. Position to direct bacteriological research group on vaccines, antibiotics and new chemo-therapeutic agents of well established midwest pharmaceutical company near large city. Some training or experience in immunology, serology, antibiotics, animal experimentation is desirable. Salary commensurate with training or experience. Write **Box N-3,** Employment Service, A.P.H.A.

Public Health Nurses, county health department, southern Michigan. Requirements: R.N. degree plus two semesters at School of Public Health Nursing. Salary without experience: $2,400 to $2,700. With at least one year's public health experience: $2,700 to $3,000. Liberal travel allowance. Write **Box L-4,** Employment Service, A.P.H.A.

Associate Bacteriologist, College degree, one year training in public health laboratory, two years' experience. Five day week. Salary $2,750. Write William A. Dorsey, Laboratory Director, Arlington County Laboratory, P. O. Box 151, Arlington, Va.

Sanitary Chemist or Engineer for staff position in engineering school, southeast. To do research work (methods of water and sewage analysis) which can be applied toward advanced degree; also will have to carry some undergraduate teaching. Write **Box E-512,** Employment Service, A.P.H.A.

Director of Public Health Nursing for Columbia County Dept. of Health. Apply: Columbia County Dept. of Health, 612 Warren Street, Hudson, N. Y.

Health Officers (M.D.) for several important city-county and other local health department openings in West Virginia. Some of the positions carry teaching responsibilities, implementing the basic salary of $6,000. Physicians are encouraged to apply even if lacking public health training or experience; must be below 35 years at first public health appointment. Write Bureau of County Health Work, West Virginia Dept. of Health, Charleston, W. Va.

Specialized Consultant Nurses in the following programs—Tuberculosis, Maternal and Child Health, School Health Service. Requirements include bachelors degree with major in public health nursing, advanced preparation in the specialty and one year of experience in generalized supervision. Travel allowance. Salary open. Write Director, Division of Public Health Nursing, State Board of Health, Jackson, Miss.

Negro M.D.—Assistant Director School Health Service in Nashville, Tenn. Public Health experience desirable but not absolutely necessary. Staff of three doctors and twelve nurses doing broad school health program in metropolitan area. Chance to affiliate with Meharry Medical School. Salary open, 12 months. Eligible for Civil Service if under 40. Communicate Director School Health Service, Nashville, Tenn.

Health Officer wanted, September through June to substitute while on educational leave. Illinois County of 35,000, 100 miles from Chicago. Salary $515 per month plus $60 month's travel. Two weeks sick leave and three weeks vacation leave provided, annually. Lee County Health Department, 123 East First Street, Dixon, Ill.

Experienced, trained man for **Public Health Executive** position in San Mateo County, California. Starting salary $7,788 per year, increasing annually over four years to $9,732. Write Civil Service Commission, Courthouse, Redwood City, Calif.

Industrial Hygiene Chemist, five years' experience. Graduate of accredited college with major in chemistry. Salary $325–$425 per month, plus travel expenses. State Civil Service position with vacation, sick leave, and retirement privileges. Send brief outline with request for application form to State Health Officer, Louisiana State Department of Health, New Orleans 7, La.

City Biochemist. $400 to $500 per month plus $48.96 cost-of-living. Two years' practical experience directing biological laboratory or comparable experience; postgraduate training equivalent to M.A. and preferably Ph.D. in one of the sanitary sciences. Applications received until needs of service filled. Write Personnel Department, City Hall, Madison 3, Wis.

Industrial Hygiene Physician. Minimum of three years' medical experience with major emphasis in the field of Industrial Hygiene, supplemented by one year postgraduate training in a school of public health with studies in Industrial and Occupational disease control. Salary range: $6,000 to $7,200. Start exceptionally well qualified person at $6,480. Under Civil Service and Retirement. Apply to: Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, 1022 S.W. 11th Avenue, Portland 5, Ore.

Associate Bacteriologist in charge of clinical laboratory in Eastern State Health Department. B.S. degree plus three years' experience, thorough foundation in chem-

istry and background in bacteriology are requisites. New position with teaching duties. Beginning salary $3,600, annual increments. Write **Box I-3,** Employment Service, A.P.H.A.

Bacteriologist for Director of Laboratory, State Health Department. Ph.D. required. Background in serology, clinical bacteriology, and public health necessary. Salary range $4,560–$5,460. Write **Box B-3,** Employment Service, A.P.H.A.

Public Health Nurse—In Out-patient department, for follow-up work and Supervision of clinic. Secretary; station wagon furnished. Salary $175 per month and full maintenance. Ideal working and living conditions. Must be between ages of 22 and 45. Contact Paul D. Grimm, M.D., Boehne Tuberculosis Hospital, Evansville 12, Ind.

Several Qualified Public Health Officers in Texas. Salary range $5,500 to $7,500 per year plus travel allowance. Apply to: Dr. Geo. W. Cox, State Health Officer, Austin, Tex.

Physical Therapists and Senior Physical Therapists for State Health Department. Physical therapists must be graduates from a school of physical therapy approved by the A.M.A. and registered in the American Registry of physical therapists. Salary $220–$260 per month. Senior positions require two years' experience. Salary $250–$300 per month. Write Merit System Supervisor, State Personnel Board, Seattle 4, Wash.

Health Officer for Saint Joseph, Mo. Graduation in medicine from a grade A medical school and not less than two years of full-time experience in public health work, or, one year of such full-time experience and the completion of a course in public health of not less than one year in residence at a recognized institution of learning required. Write E. C. Jenkins, Clerk, Board of Health, Saint Joseph, Mo.

Public Health Nurse for generalized Public Health Program. Salary to start $2,500. Must register in Connecticut. City of 40,000 people. Five Parochial Schools included in work. Dependability a necessity. Retirement Fund. Must drive car. Apply: Health Officer, 47 Main Street, Bristol, Conn. Give qualifications and experience.

Two Public Health Nurses for growing Health Department in southeastern Michigan. Opportunity to work under supervision. Also opportunity for some postgraduate training at nearby School of Public Health. Must have completed one year in recognized school of Public Health. Salary range $2,400–$2,600, plus travel. Write H. C. Huntley, M.D., Director, Lenawee County Health Department, Adrian, Mich.

Director of Industrial Hygiene in West Virginia State Department of Health, Charleston. Salary $6,000 plus travel. Position under state merit system. Qualifications: M.D. with two years' full-time professional experience in the field of industrial hygiene. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

County Health Officers in the West Virginia State Department of Health. Salaries from $4,400 to $6,000 per annum, plus travel allowance, depending on training and experience. Position under state merit system. Qualifications: M.D. with at least two years of full-time professional experience in the field of public health. Must be eligible for West Virginia license. Write Dr. N. H. Dyer, State Health Commissioner, State Department of Health, Charleston 5, W. Va.

Health Officer for newly established Bi-County Health Department in Central Illinois. Combined population approximately 33,000, mostly agricultural. Staff of eight contemplated. Trained and experienced physician wanted to fill the position. Excellent public support. Salary $7,200 plus travel. Write: Mr. E. R. Rinehart, Secretary, DeWitt-Piatt County Board of Health, Farmer City, Ill.

Public Health Nurses in official generalized program of Washtenaw County, Michigan, at Ann Arbor. Agency is field teaching center for University of Michigan. Opportunity to study at University. Beginning salary $2,700; $600 travel allowance. Write for details to Nursing Director, 720 E. Catherine St., Ann Arbor, Mich.

POSITIONS WANTED

Position in School Health Education or Community Organization in public health. Seventeen years' experience in teaching and community organization in public health. M.S.P.H. from a leading university. East or Middle West preferred. Write **Box H-538**, Employment Service, A.P.H.A.

Sanitary Engineer with five years' experience in public health engineering, including waste disposal, insect control, and industrial sanitation, desires position in the East. M.S. degree in Sanitary Engineering. Veteran, age 29. Reply **Box E-510**, Employment Service, A.P.H.A.

Public Health and Sanitary Engineer. Master's degree in sanitary engineering. Experience: District Engineer with State Health Department 4 years; Sanitary Corps U. S. Army 4 years; consulting Sanitary Engineer 2 years. Some teaching experience. Seeks position in official agency, private industry or teaching institution. Write **Box E-518**, Employment Service, A.P.H.A.

Recent Graduate Veterinarian (KSC '47) desires employment. Has had experience working for the Health Department of the District of Columbia. Age 32, married, no children. Write **Box V-304**, Employment Service, A.P.H.A.

Position as **Educational Research Worker** in public health and/or community educator with special reference to planning and organizing programs in sanitation and other phases of public health. Trained in education, social work and public health, with doctorate in latter field. Writing experience with public health agencies in preparing copy for newspaper and other publications; several years of field experience in sanitation. Position in west or mid-west preferred. Write **Box C-3**, Employment Service, A.P.H.A.

Parasitologist, male, 28 years old, B.S., some graduate training. Six years' experience in the field of parasitology in civilian governmental agency, army, university and industrial laboratory. Experience includes routine examinations, field work and research in parasitology and some serology. Write **Box L-533**, Employment Service, A.P.H.A.

Former Sanitary Engineer (RC) Public Health Service, long experience, now employed, desires position sanitary engineer or director sanitation with municipal or local health unit. Write **Box E-514**, Employment Service, A.P.H.A.

NEW YORK CITY HEALTH DEPARTMENT ANNOUNCES EXAMINATION FOR DIRECTOR OF PUBLIC HEALTH NURSING SERVICE

An examination for the position of Director of Public Health Nursing Service will be held in New York City this fall. Candidates must be graduates of an approved school of nursing; hold a baccalaureate degree registered by New York State; have ten years' experience in public health nursing, five of which must have been in a responsible administrative capacity. A combination of training and experience which is an equivalent of the above is permissible. Citizenship and residence requirement. Beginning salary range $5,000–$6,500 plus 10 per cent cost of living adjustment. Applications must be filed before September 30, 1947. Application blanks must be collected and submitted personally or by agent of the applicant at 96 Duane Street, New York 7, N. Y.

PUBLIC HEALTH OPPORTUNITIES FOR PHYSICIANS IN THE STATE OF ILLINOIS

The Illinois State Department of Health announces a number of opportunities for physicians as described below. For detailed information address Roland R. Cross, M.D., Director, Illinois State Department of Health, Springfield, Ill.

1. Two vacancies exist in State Health Districts in southeastern and west central Illinois. Trained and experienced public health physicians are wanted as State District Health Officers. Salary range $5,760–$6,960, starting salary depending on qualifications. Civil service retirement and sickness benefits. Opportunity for advancement.

2. An examination will be held on October 27 in Chicago to provide a list of candidates for the openings in the Champaign-Urbana and in the Stickney Health District. Requirements: M.D. (AMA approved); Internship (AMA approved); one year postgraduate study in public health plus two years' public health experience *or* three years' public health experience; eligibility for Illinois licensure. Salary: Champaign-Urbana . . . maximum beginning $7,200; Stickney . . . $7,000. Admission to the examination only with certificates granted prior to examination.

3. A vacancy for a well qualified health officer exists at the DuPage County Health Department. Population 103,480, suburban to Chicago, and farming community. Beginning salary $6,000–$7,200 depending on training and experience.

NEWS FROM THE FIELD

NEW ENGLAND HEALTH INSTITUTE RESUMES

A 1947 session of the New England Health Institute was held in Durham, N. H., June 16-18 under the auspices of the 5 New England State Departments of Health with the New Hampshire State Department and the University of New Hampshire hosts to more than 800 registrants.

Among the features of the three day meeting was the first joint sectional meeting at which several speakers emphasized the importance of community participation, not only in backing the health officer, but in real coöperative program planning. There was an admirable survey presented of what the Hospital Survey and Construction Act can mean to a local community both from the standpoint of bricks and mortar and from the standpoint of building a coördinated community health program.

Professor Ira V. Hiscock of Yale presented an excellent review of the problem of district health units in New England which involves town and city relationships somewhat different from the rest of the United States. Other features of the program included emphasis on health education, geriatrics, cancer and mental hygiene, as well as on industrial hygiene.

W. Lloyd Aycock, M.D. of Harvard presented a fruitful and suggestive analysis of the broader problems of epidemiology as applied to poliomyelitis.

The last session of the Laboratory Section indicated real progress in the laboratory diagnosis of influenza and in the classification and recognition of the cause of enteric infections.

An unusual list of prominent speakers featured the program and a resolution was unanimously passed urging the United States Congress to approve adherence by the United States to the Constitution of the World Health Organization.

CUBA APPOINTS NEW DIRECTOR GENERAL OF HEALTH

On June 11 Dr. Ramon Grau San Martin, President of the Republic of Cuba, appointed Dr. Luis Espinosa y G. Caceres as Director General of Public Health. Dr. Espinosa has been serving as Director of the Division de Relaciones Medicas y Sanitarias Panamericanas in the Cuban Government.

DR. SCHEELE TO HEAD NATIONAL CANCER INSTITUTE

At the recent quarterly meeting of the Advisory Council of the National Cancer Institute, the resignation of R. R. Spencer, M.D., as Chief of the Institute was announced, effective July 1. He was succeeded by Leonard A. Scheele, M.D., formerly Assistant Chief of the Institute.

Dr. Spencer will remain with the Institute and in his own words is "shedding the constantly increasing load of administrative duties in order to spend full time on the two phases of the cancer program that interest me most—professional education and research."

At the same meeting, the appointment of Dr. A. C. Ivy, Vice President of the University of Illinois and one of the country's leading physiologists, as Executive Director of the National Cancer Advisory Council was announced.

TYPHUS COMMISSION MEDAL TO COL. RUDOLPH

Myron P. Rudolph, Colonel, MC, AUS, was awarded the United States of America Typhus Commission Medal recently by the War Department.

The citation notes that he "distinguished himself by exceptionally meritorious service in . . . the work of the Commission, by planning and supervising with marked ability and conspicuous success the administration . . . of details for the control of a typhus fever epidemic raging in the midst of thousands of concentration camp internees . . . He rendered invaluable service by organizing in the Dachau camps and in Southern Bavaria medical units and agencies on a large scale maneuver to bring the typhus epidemic under control."

STOVALL CANCER AWARD ESTABLISHED IN WISCONSIN

It has been announced in Madison, Wis., by the State Division of the American Cancer Society that an award honoring William D. Stovall, M.D., who is President-Elect of the Wisconsin Medical Society and Director of the State Laboratory of Hygiene, has been established. An annual award of $250 will be made to a Wisconsin resident student at the University whose primary academic interest is related to cancer. According to the announcement the grant has been created as a tribute to Dr. Stovall for his years of faithful service to the cancer organization and in recognition also of his accomplishments in developing a public consciousness of malignant growths. The first award was made on May 26 to a veteran enrolled in biochemistry, Myrton C. Rand.

NEED A PATENT FREE?

The Office of the Solicitor, U. S. Department of the Interior, has recently advised the Association of certain patents which have been assigned to the Secretary of the Interior and which are available for licensing. Such licenses are customarily used on a non-exclusive royalty-free basis. The announcement goes on to say that it is the desire of the office of the Solicitor to see the patents as widely used as possible.

From the titles, most of the material listed would not have any application to public health activities. Two titles, however, "Water Survey Apparatus," and "Production of Potable Water from Saline Solutions," indicate some possible application to the field of public health.

Anyone desiring further information should address the Solicitor, Department of the Interior, Washington 25, D. C.

DR. PORTERFIELD APPOINTED OHIO DIRECTOR OF HEALTH

John D. Porterfield, M.D., M.P.H., has been appointed Director of Health of the State of Ohio by Governor Herbert, effective August 1. Dr. Porterfield, who is a native of Chicago, received his Medical Degree in 1938 from Rush Medical College of the University of Chicago, and his M.P.H. in 1944 from John Hopkins University. He has served for 8 years in the Commissioned Corps of the U. S. Public Health Service, reaching the rank of Surgeon before being released from active duty to accept his present position. During the war he spent 14 months in the Caribbean area, serving as Public Health Service Venereal Disease consultant in the American possessions. He was a consultant, clinic director, and instructor at the School of Tropical Medicine, San Juan, Puerto Rico, and did surveys in International health for the Anglo-American Caribbean Commission, visiting British Guiana, Jamaica, and the British West Indies. For 18 months Dr. Porterfield has been Chief of the Division of Venereal Disease Control in the Ohio Depart-

ment of Health, but since March, 1947, has been attached to the Reserach Grants Division, National Institute of Health, Bethesda, Md., working in connection with grants-in-aid for medical research. Dr. Porterfield succeeds Roger E. Heering, M.D., M.P.H., who has resigned to enter private practice.

LEGION OF MERIT AWARDED TO DR. LARIMORE

The War Department has announced that the Legion of Merit has been awarded to Captain Granville W. Larimore, M.C., A.U.S., of New York City, presently the Director of Health Education in the American Cancer Society. According to the citation, Dr. Larimore, while serving in various capacities in the preventive medicine service, Office of the Surgeon General, performed notably outstanding service. As Chief of the Education Branch, Venereal Disease Control Division, he was a key figure in promoting a complete Army-wide venereal disease education program. Also as Chief of the Health Education Unit his responsibilities were extended to all health education matters in the field of preventive medicine. Dr. Larimore is a graduate of Rush Medical College, University of Chicago, in 1936. He holds an M.P.H. degree from the Harvard School of Public Health.

MERCK AWARDS FOR TRAINING SCIENTISTS

Late in May, the National Research Council announced 5 awards to provide promising young scientists with further research training in the closely allied fields of chemistry and biology. The research will be carried on in various biochemical subjects at the California Institute of Technology, Rockefeller Institute for Medical Research, the Universities of Wisconsin and Rochester, and the Naples, Italy, Zoological Station.

A. N. Richards, M.D., of the University of Pennsylvania, is Chairman of the Merck Fellowship Board of the National Research Council. Applicants may apply to this Board (2101 Constitution Avenue, Washington, D. C.) for fellowships at any time. The closing date for the academic year 1948–1949, is December 31, 1947.

1947 OCCUPATIONAL DISEASE COMPENSATION LAWS

The Legal Committee of the Industrial Hygiene Foundation, whose Chairman is Theodore C. Waters, has prepared an analysis of the new occupational disease compensation laws enacted in 5 states at the 1947 sessions of their legislatures. It also summarizes the amendment to the New York Occupational Disease Law and reports the appointment of legislative commissions to study such legislation in Vermont and Montana.

This analysis is available, apparently without charge, from the Industrial Hygiene Foundation, 4400 Fifth Avenue, Pittsburgh 13, Pa.

RHEUMATIC HEART DISEASE TO BE STUDIED IN NEW YORK

The New York University College of Medicine in coöperation with the New York City Health Department will study the crippling effects of rheumatic fever and rheumatic heart disease among school children. The study will be made in the Lower East Side District where a preliminary study was made in 1946. Of nearly 1200 eighth grade children examined at that time, more than 3 per cent were found to have existing or potential heart disease. In all of New York City, it is estimated that 7,000 school children have rheumatic fever.

The study will be directed by Elvira DeLiee, M.D., of the Department of Preventive Medicine of the New York University. It is supported by the New York Heart Association and the U. S.

Public Health Service, and will have the coöperation of the New York City Department of Education, the New York School of Social Work, the Metropolitan Life Insurance Company, the Rheumatic Fever Council of the American Heart Association, and the U. S. Children's Bureau.

AMERICAN HEART ASSOCIATION ELECTION

At the annual meeting of the American Heart Association in Atlantic City, June 6–7, Dr. Arlie R. Barnes, was elected President and Dr. Tinsley R. Harrison, President-Elect. Other officers are Dr. Carl J. Wiggers, Vice-President, Dr. Harry E. Ungerleider, Secretary, and Samuel Harrell, Treasurer. Thomas I. Parkinson, President of the Equitable Life Assurance Society of the United States, was named Chairman of the Board of Directors.

KANSAS CITY HEALTH DEPARTMENT INTEREST IN PREVENTION OF HOME ACCIDENTS

Harry F. Schulte, Industrial Hygiene Engineer, Kansas City Metropolitan Area Health Department, recently gave a discussion of the toxicity of common solvents used in home dry cleaning and painting, before the Missouri Public Health Association meeting. The department is making a meritorius effort to publicize information of this character which will prevent a type of home accident that occurs frequently.

WHITNEY FOUNDATION TO STUDY RHEUMATIC FEVER

The Helen Hay Whitney Foundation for Rheumatic Fever Research was recently organized. It will stimulate research into the cause of rheumatic fever which is the leading fatal disease of childhood as well as the later cause of crippling heart disease. The Foundation will stimulate research through grants-in-aid to universities, hospitals, and other research institutions. Its first undertaking will be a survey of resources and needs in the rheumatic fever field.

The Medical Director of the newly organized Foundation is T. Duckett Jones, M.D., who is also a director of the American Heart Association and Chairman of its Council on Rheumatic Fever. He is a member of the Advisory Committee on Crippled Children's Services of the Federal Security Agency.

Temporary headquarters of the Foundation are at New York Hospital, 525 East 68th Street, New York, N. Y.

INDUSTRIAL HYGIENE DIVISION IN ARKANSAS

The 1947 Arkansas State Legislature passed the Industrial Health Service Act establishing a Division of Industrial Hygiene in the State Board of Health. The act authorizes the Division to investigate places of employment, and to study the conditions which might be responsible for ill health of the industrial worker. The Board of Health will also adopt rules and regulations pertaining to the control of industrial health hazards.

RETIREMENT OF MARY SWAIN ROUTZAHN

Early in June the Russell Sage Foundation announced the retirement of Mrs. Mary Swain Routzahn who has been Director of the Foundation's Department of Social Work Interpretation. She began her service in the Foundation in the Department of Surveys and Exhibits 35 years ago with her husband, the late Evart G. Routzahn. She pioneered in developing many of the present-day techniques of presenting information to the public. Together also, they with others organized the Public Health Education Section of the American Public Health Association, and developed guides and study courses for students of publicity techniques. Mrs. Routzahn helped to found the National Publicity Council for Health and

Welfare Services and for many years directed its work. In 1944 the first national Elizabeth Severance Prentiss Award in Health Education was made to Mrs. Routzahn, and posthumously to Mr. Routzahn. Mrs. Routzahn will continue teaching courses in social work interpretation at the New School of Social Work, and serve as Consultant to the National Publicity Council.

DEATH OF DR. HILL

Hibbert Winslow Hill, M.D., D.P.H., died on May 23 at the home of his son in Hackensack, Minn. For half a century a public health worker in both Canada and the United States, Dr. Hill was a pioneer in the development of public health as concerned with the individual and not merely with the physical environment. His *New Public Health*, *The New Hygiene*, and *Sanitation for Public Health Nurses* all expressed his deep sense of the obligation of the profession to the public, and his keen critical evaluation of existing public health methods. He was the first bacteriologist to serve in a full-time capacity in Canada and he was the first official epidemiologist in the United States.

Retired since 1934 because of ill health, he had previously been Professor of Bacteriology in the University of British Columbia, Director of the Institute of Public Health in London, Ontario, and Executive Secretary of the Minnesota Public Health Association. Between 1905 and 1912 he was with the Minnesota State Board of Health, first as Assistant Director of Laboratories and Assistant Professor of Bacteriology in the University of Minnesota, and later as Director of the Division of Epidemiology.

BRITISH HEALTH CONGRESS

At the latest Health Congress convened by the Royal Sanitary Institute in Torquay, England, June 2–6, 977 government departments, local authorities, and scientific bodies were represented. Among the American representatives were Harry S. Mustard, M.D., President of the A.P.H.A., and Martha M. Eliot, M.D., of the U. S. Children's Bureau and President-elect of the Association.

According to *The Medical Officer*, "uncertainty and anxiety about the future under the National Health Service Act was reflected throughout the discussions . . . particularly the problem of the future career of the district M.O.H."

Sir Andrew Davidson, Chief Medical Officer, Department of Health for Scotland, ended his presidential address with "The grim experience of the past few years and the potentialities of modern scientific discoveries for good and for evil alike, bring home urgently and acutely the fact that the destiny of mankind depends upon the benign attributes of the human mind and heart. Few are so favourably placed to guide that destiny as those concerned with the preservation of the health of the world's peoples."

IN-SERVICE TRAINING IN ACTION

"What's New in Public Health," a series of 12 lectures for public health workers in the North Metropolitan District of the Massachusetts Department of Public Health, was held in the spring of 1947.

Realizing that during the war years due to heavy work schedules and other restrictions, it had been difficult for workers to keep pace with the many new developments, Dr. A. Daniel Rubenstein, Health Officer of the North Metropolitan District, planned the lectures. Expenses of the course were assumed by the Middlesex Health Association, and Harvard School of Public Health provided the facilities.

Members of the Harvard School of Public Health faculty, staff of the Massachusetts Department of Public

Health, and national public health experts gave the various lectures. Sixty-seven public health workers including board of health, school, and industrial nurses; board of health agents; and health educators attended the sessions.

"EYE-BANK" FOR BOSTON

The Eye-Bank for Sight Restoration (national headquarters, 210 East 64th Street, New York, N. Y.) celebrated its second anniversary in May by establishing an affiliated eye-bank in Boston, prepared to serve the needs of New England. Seven hospitals in the Boston area and one in Maine have already become affiliated with it. In 1946 the first anniversary was marked by the announcement of an eye-bank in Chicago to serve the Midwestern area.

The parent association and its affiliates collect and preserve healthy corneal tissue from human eyes for transplanting to blind persons who have lost their sight because of corneal defects. The demand for eyes still exceeds the supply. Among the activities of the eye-bank is public education to urge persons to donate their eyes for use after death.

LINCOLN AND LANCASTER COUNTY, NEBRASKA, JOIN FORCES

By authorization of the 1947 Nebraska legislature, the Lincoln City Health Department was recently extended to include all of Lancaster County, thus forming a consolidated city-county unit.

The Health Officer of this city-county unit is Corinne S. Eddy, M.D. She has had previous public health experience in both Alabama and Mississippi.

CHARLESTON AND KANAWHA COUNTY HEALTH DEPARTMENTS MERGE

On July 1, the largest county in West Virginia, Kanawha, consolidated with its chief city, Charleston, which is also the state capital, to form a city-county health unit. The consolidation of the two agencies had long since been advocated by the U. S. Public Health Service and the State Department of Health, and represents the successful culmination of a drive by many agencies to combine the overlapping city and county health work. The city council of Charleston and the county court have each appropriated $32,000 for the operating expenses for the new fiscal year. This represents an initial per capita appropriation of about 33 cents from local funds.

The director of the new city-county unit had not been appointed at the end of July.

TWO NEW BUREAUS CREATED BY WEST VIRGINIA PUBLIC HEALTH COUNCIL

At a recent meeting the West Virginia Public Health Council, upon recommendation of the State Health Commissioner, created a Bureau of Mental Health which is being financed by funds available through the National Mental Health Act recently passed by Congress and matching state funds. W. B. Rossmann, M.D., Charleston, will head the Bureau of Mental Health.

The passage in the 1947 Legislature of a hospital licensing bill led also to the creation of a Bureau of Hospital and Medical Care. Inasmuch as the licensing act becomes effective July 1, 1948, this Bureau will not be put into operation until that time.

INDUSTRIAL HYGIENE IN HIGH SCHOOL

High school students in Portland, Ore., will learn the meaning of industrial hygiene and how it is practised, especially in Portland industries. The superintendent of schools has announced that the unit will be taught as a part of the health course of study. This is the first time that industrial hygiene has been an integral part of such a high school course.

The lessons are designed to acquaint students with the health hazards they

may meet in future jobs, the physiological effects of the hazards, and the preventive measures which may be employed. Emphasis is placed on the necessary coöperation of the workers to prevent occupational disability.

Authors of the plan are health education specialists, high school health teachers, and members of the Division of Industrial Hygiene, Oregon State Board of Health.

FOREIGN GROUP TO STUDY AMERICAN BLOOD PROGRAM

Scholarships for the study of blood and its derivatives are being offered to a selected group from foreign countries by the American Red Cross in coöperation with the League of Red Cross Societies. Candidates proposed by the national Red Cross societies will be selected on a basis of personal and professional qualifications, as well as on the need in their country for information on the use of blood fractions. The scholarships will be for 9 to 12 months of study in the United States and will have a value of $2,500 to $3,000. The training will include methods of recruiting donors, collecting and processing blood, processing plasma and the uses of blood and blood derivatives in medicine and public health. Field work will be done in North Dakota for mobile field laboratory operation, in Michigan for its state plan of plasma fractionation and in Miami, Fla., for private blood bank maintenance. Details of the training were worked out by Dr. Warren F. Draper, Washington, D. C., Assistant Administrator, Medical Services, American Red Cross, in coöperation with Dr. Charles A. Janeway of Boston, Chairman of the Red Cross Advisory Committee on Blood and Blood Derivatives.

NUTRITION AWARDS

The American Institute of Nutrition made two awards at its annual dinner in Chicago, May 19. The Borden award for 1947 was presented to Leonard A. Maynard, Ph.D., Ithaca, N. Y., for contributions to the physiology of milk secretion, factors affecting milk production and milk composition, and the requirements of animals for dietary fats. The Mead Johnson and Company award for research on the vitamin B complex was presented to Dr. William J. Darby, Associate Professor of Biochemistry, Vanderbilt University School of Medicine, Nashville, Tenn., Paul L. Day, Ph.D., Professor of Physiologic Chemistry, University of Arkansas School of Medicine, Little Rock, and E. L. Robert Stokstad, Ph.D., Research Chemist, Lederle Laboratories, Pearl River, N. Y., for their investigations on B complex vitamins with special reference to studies on the chemistry and nutritional significance of folic acid.

SHORT COURSE IN INDUSTRIAL HYGIENE AT GEORGIA SCHOOL OF TECHNOLOGY

The division of graduate studies of the Georgia School of Technology has just completed an 11 week course in industrial hygiene for engineers. It was designed to provide a comprehensive background for men with collateral scientific or engineering training who are interested in work in industrial hygiene.

The need for personnel in industry as well as governmental work prompted the arrangements for this intensive one-quarter course at graduate level.

MARYLAND DIVISION OF CANCER CONTROL

A Division of Cancer Control has been created in the Bureau of Medical Services of the Maryland State Department of Health. Dr. W. Ross Cameron, Baltimore, Assistant Director of Welfare for Medical Care, and Dr. Howard W. Jones, Jr., Baltimore, Maryland, Division of the American Cancer Society, will assume joint responsibility for the development of a program including

statistical studies, educational activities, and the organization of adequate preventive diagnostic and treatment facilities.

OFFICE OF RECRUITMENT AND TRAINING IN CALIFORNIA

An Office of Recruitment and Training, with George T. Palmer, Dr. P.H., as coördinator, has been established in the California State Department of Public Health, San Francisco. The new unit will serve to coördinate the department's activities in this field. Dr. Palmer, who will be assisted in the administration of the office by an advisory board consisting of various staff members, has recently served as Senior Sanitarian, (R), U.S. Public Health Service, preceding which he was Associate Field Director of the American Public Health Association.

PROPOSAL TO PROVIDE GRANTS FOR POSTGRADUATE SCHOOLS OF PUBLIC HEALTH

Senator Robert A. Taft of Ohio, on June 17, introduced into the Senate of the United States a bill "to amend the Public Health Service Act to provide grants to postgraduate schools of public health." This bill would provide a sum to enable the Surgeon General to assist in improving the training available in the field of public health. The funds are to be used for the establishment and maintenance of teaching staffs, maintenance and operation of facilities, and scholarships for persons contemplating work in the field of public health. An additional appropriation is provided for the construction of buildings and other facilities, if necessary.

The appropriation for the operation of schools would be available on the basis of enrollment. The bill also provides that grants could be made only to those postgraduate schools of public health that are accredited by a board approved by the Surgeon General.

The bill was referred to the Committee on Labor and Public Welfare but no action was taken on it during the 80th Congress.

ENRICHMENT OF CORN PRODUCTS

The Food and Nutrition Board of the National Research Council at a meeting in May, 1947, adopted the following resolution with regard to the enrichment of corn products:

> That universal enrichment of all corn products should be achieved as promptly as possible, especially in all areas of the United States where the average annual per capita consumption of corn products equals or exceeds fifty pounds;
>
> That all states in such areas should adopt the federal standards for purposes of legislation concerning the enrichment of corn products;
>
> That state and federal authorities should take immediate steps to foster the enrichment of all whole corn products produced within the borders of each such state;
>
> That mandatory legislation requiring the enrichment of both whole and degerminated corn products should be enacted and enforced as soon as practicable in each such state.
>
> The Board further directs that a copy of this resolution be sent to the Surgeon General of the U. S. Public Health Service and the Director of the U. S. Agricultural Extension Service for transmission to their officers and agents in the Southern States; to the presidents of the agricultural colleges of the South, to the commissioner of health of each Southern State, to the American Public Health Association, and to the Council on Foods and Nutrition of the American Medical Association.

Corn was first included as a cereal to be considered for enrichment by the Board in 1941 as a measure for the prevention of pellagra and other nutritional deficiencies in areas of high corn consumption. Such enrichment was endorsed as early as 1943 and a tentative partial enrichment formula proposed. Finally, early in 1946, it recommended nutrient levels in corn products corresponding substantially to those in effect for enriched flour. The issuance by the Federal Food Administration in

1947 of definitions and standards for enriched corn products gave further impetus to the promulgation of the Food and Nutrition Board's most recent resolution.

In order to develop plans for corn enrichment, the Board held a two day conference in mid-July at Clemson A & M College, Clemson, S. C. Here were discussed the most effective procedures for developing the enrichment program as well as the educational problems and techniques for establishing better public understanding of the need for enrichment. Clemson College for the past 3 years has demonstrated the feasibility of enrichment of whole corn meal in small mills and has led in developing suitable cheap machinery and usable enriching mixtures. Representatives were present at this conference from the 13 states from West Virginia to Oklahoma where the consumption of corn products is extensive enough to have public health significance.

NEW OFFICERS OF TWO AFFILIATED SOCIETIES OF A.P.H.A.

Arizona Public Health Association—

President—Margaret J. Maleady, R.N., Bisbee

President-Elect, O. V. Cooper, Phoenix

Vice-President, Clerks' Section—Eunice Ross, Bisbee

Vice-President, Health Officers Section—Paul W. McCracken, M.D., Phoenix

Vice-President, Laboratory Section—Mr. Bayless, Bisbee

Vice-President, Nurses' Section—Marjorie Fairley, Wilcox

Vice-President, Sanitarians' Section—Oscar V. Cooper, Phoenix

Secretary-Treasurer—Jefferson I. Brown, R.N., Phoenix

Utah Public Health Association—

President—LaVerna Peterson, Ogden

President-Elect—Frederic M. Kriete, M.D., Salt Lake City

Vice-President—James Z. Davis, M.D., Salt Lake City

Treasurer—Verle B. Lesnan, R.N., Salt Lake City

Secretary—Louis P. Gebhardt, M.D., Salt Lake City

WEST VIRGINIA PUBLIC HEALTH ASSOCIATION

At a recent meeting of the West Virginia Public Health Association, the following officers were elected for the year 1947-48:

President—L. A. Dickerson, M.D., Health Officer, Madison.

1*st Vice-President*—L. A. Lively, Sanitarian, Bluefield.

2*nd Vice-President*—Charlotte McLoughlin, Public Health Nurse, Kanawha County Health Department.

Secretary-Treasurer—Annette King, State Health Department.

HAWAII PUBLIC HEALTH ASSOCIATION

The Hawaii Public Health Association elects new officers:

President—Virginia Jones.
Vice President—Robert Horton, M.D.
Secretary—Katherine Walter.
Treasurer—Andrew Wong.

C. L. Wilbar, Jr., M.D., President of the Board of Health, was elected to the executive committee, with Virginia Doyle and Robert Lloyd.

CANCER INSTITUTE FOR PUBLIC HEALTH NURSES

The Ohio Division of the American Cancer Society, with the coöperation of the Ohio State Department of Health and the Western Reserve University School of Nursing, in June held a three day Cancer Institute for Public Health Nurses at the Cleveland Health Museum. Called on a state-wide basis, the Institute was designed to give public health nurses in the state a background of information and interest for sharing in the cancer control program.

VIRGINIA EXTENDS LOCAL HEALTH SERVICE

Announcement has been made by the Virginia Health Department of the addition of Surry County to the already existing tri-county health unit including Dinwiddie, Prince George, and Sussex Counties. The combined population of the four counties, without the inde-

pendent cities of Hopewell and Petersburg, which have their own health departments, is about 50,000. The Health Officer is Francis J. Clements, M.D.

Also reported by Virginia are the appointment of Walter R. Johnson, M.D., and Merle V. Bemis, M.D., respectively as Health Officers of the Alleghany-Botetourt and Buchanan-Tazewell bi-county health units. Both of these districts have been without health officers for a number of months.

INDUSTRIAL HEALTH CONSULTANT SERVICE

Gordon C. Harrold, Ph.D., and Stuart F. Meek, M.D., formerly Chief Industrial Hygienist and Assistant Medical Director respectively for the Chrysler Corporation, and more recently independent consultants, with a group of associates have organized a confidential consultant service in the broad fields of industrial health, hygiene, and safety for individual clients.

Their organization is called the Industrial Health, Hygiene and Safety Service. Its headquarters are at 18221 Muirland Avenue, Detroit, Mich.

DRS. LANZA AND MELENEY DIRECT INSTITUTE OF INDUSTRIAL AND SOCIAL MEDICINE

Among the plans announced for the new fifteen and a half million dollar New York University-Bellevue Medical Center in New York City are plans for an Institute of Industrial and Social Medicine. According to an announcement by the University, the co-directors of the Institute will be Anthony J. Lanza, M.D., recently Associate Medical Director of the Metropolitan Life Insurance Company and formerly Colonel in the U. S. Army Medical Corps, and Henry E. Meleney, M.D., Professor of Preventive Medicine at New York University. In announcing the plan Dean Currier McEwen of New York University Medical School reported that this project would cost $1,575,000 for laboratories, clinical facilities and administration. Among its features will be a general clinic to be opened in the fall of 1947 to offer wage earners a comprehensive plan of medical care. Dr. Lanza estimates that the annual loss to the nation in wages and medical expenses because of absences from work occasioned by illness approaches eight billion dollars.

GRANT FOR MULTIPLE SCLEROSIS RESEARCH

The Association for the Advancement of Research on Multiple Sclerosis has made its first grant, of $64,350, for specialized research on multiple sclerosis. For a three year period, it will cover research in the field of allergy in relation to the disease. The research will be under the direction of Elvin A. Kabat, M.D., Assistant Professor of Bacteriology at Columbia University, and known for his research in specialized fields of medicine. His work will be done largely at the Columbia University College of Physicians and Surgeons and the Neurological Institute of New York.

BRUCELLOSIS CENTER ESTABLISHED AT FINLAY INSTITUTE

On March 10, 1947, the Finlay Institute, Havana, Cuba, established a new service to cover general investigation and the bacteriological quality of milk and the specific study of brucellosis. At the recent inauguration ceremonies, particular credit was given to Dr. Ramón Grau San Martín, President of Cuba and Dr. José R. Andreu, Minister of Health and Social Assistance, for their special interest and help in securing the establishment of these new activities.

MAINE'S NEW SECTION OF INDUSTRIAL HEALTH

A section of Industrial Health was established in the Maine Bureau of

Health in January. Its director is J. Elliot Hale who, in 1938, made a survey of the industrial health problem in the state. It was then found that many unsatisfactory working conditions existed. Consequently a program was planned of engineering, statistical, and educational services to Maine industries. Mr. Hale has been for many years Senior Sanitary Engineer in Maine's Division of Sanitary Engineering.

PERSONALS

Central States

LEROY L. FATHERREE, M.D., M.P.H.* Health Officer of Omaha, Neb., has been designated officially by Douglas County as County Health Officer. Dr. Fatherree will serve as Health Officer for the combined area.

THOMAS A. GARDNER, M.D., Assistant Public Health Director of the city of Springfield, Ohio, since last October, was appointed Director of Health recently.

FRANK H. JENNE, has been named Assistant Secretary of the Cincinnati, Ohio, Public Health Federation and will take up his duties on September 15. Mr. Jenne received his Master of Health degree from the University of Michigan in June, and will complete field training at the Training Center, Savannah-Chatham Health Department, Savannah, Ga., in September before taking up his position with the Federation.

JOHN F. SHRONTS, M.D.,† on April 1 began his duties as Medical Director of General Mills, Inc., Minneapolis, Minn. He had previously been Chief of the Division of Industrial Hygiene of the Illinois State Health Department, and is one of the authors of the *Medical Survey Report* of the bituminous coal mining industry recently published.

CORA M. TEMPLETON, R.N.,* Director of Public Health Nurses, Cleveland Health Department, retired as of June 30, after 34 years of service, 27 of them as director. CARRIE E. LEWIS, R.N.,† Assistant Director of Nurses in Tuberculosis Control since 1929, has been appointed Acting Director of Nurses.

PERCY T. WATSON, M.D., M.P.H.† formerly Director of Public Health District No. 1 with headquarters in Bemidji, Minn. was awarded the honorary degree of Doctor of Science by Carleton College, Northfield, Minn., at its commencement program, June 9, for his many contributions to international good will and human betterment. Dr. Watson was appointed Director of the Minneapolis Division of Local Health Services, effective July 1.

Eastern States

STANHOPE BAYNE-JONES, M.D.,* recently Dean at the Yale University School of Medicine, New Haven, Conn., and recently Director, Board of Scientific Advisors, Jane Coffin Childs Memorial Fund for Medical Research, has been appointed President of the Joint Administrative Board of New York Hospital, Cornell Medical Center, New York, N. Y., effective July 1 with offices at 525 East 68th Street.

LEVERETT D. BRISTOL, M.D., Dr.P.H.,* has resigned as Commissioner, Maine State Department of Health and Welfare, in which position he has served for the last 2 years. Thirty years ago he became Maine's first Commissioner of Health, before the State Departments of Health and Welfare were combined. For many years, he was active in New York City as Director of the Bellevue-Yorkville Health Demonstration, and as Health Director of the American Telephone and Telegraph Company. He is a past

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† Member, A.P.H.A.

president of the Public Health Association of New York City, and of the New Jersey Health and Sanitary Association.

JAMES E. BRYAN,† has resigned as Executive Secretary of the Medical Society of the County of New York, and Managing Editor of *New York Medicine* on September 1, to become Executive Officer of the Medical Society of New Jersey with headquarters in Trenton.

MONROE DAVIS EASTON, M.D., became Associate Professor of Bacteriology and Immunology in the Harvard Medical School on July 1. He had previously served 3 years in this department, and also as instructor in the Yale and Washington University Schools of Medicine. Since 1937 he had been a member of the staff of the International Health Division of the Rockefeller Foundation and Director of the Research Laboratory of the California State Department of Public Health.

JOHN EDWARD FARRELL,* Executive Secretary of the Rhode Island Medical Society and the Providence Medical Association was granted an honorary degree of Sc.D. at the June Commencement exercises of Providence College.

FRANK ROBERT FRECKLETON, M.D., M.P.H.,† who has recently finished his course in the Columbia University School of Public Health, has been appointed to the staff of the Rensselaer County Department of Health, Troy, N. Y.

DON M. GRISWOLD, M.D.,* District State Health Officer in charge of the Geneva District, retired May 31, completing 16 years of service on the staff of the New York State Department of Health. Dr. Griswold is author of a textbook *Outline of Epidemiology* developed for use in teaching medical students and health officers. He is also author of many scientific papers on such subjects as epidemiology, public health administration, administrative control of tuberculosis, the control of typhoid carriers, control of measles, and whooping cough, and communicable diseases in the tropics.

LOWELL IBERG has been named Associate Director of the New York State Charities Aid Association. He has been with the Association since 1940, except for leaves to work with UNRRA and with the New York State Committee on Child Care.

L. E. KLING, M.D.,† who on July 1 completed 6 years service with the U. S. Public Health Service, was appointed Acting Medical Director of the Planned Parenthood Federation of America with headquarters in New York, N. Y.

RUSSELL H. KURTZ, Editor of the *Social Work Year Book* published by the Russell Sage Foundation, New York, N. Y., has resigned to become Executive Director of the New Hampshire Citizens Council for the General Welfare with offices in Concord, N. H.

W. C. SPRING, M.D., M.P.H.,† who recently completed his public health course at Columbia University School of Public Health, has been appointed Commissioner of Health of the newly-established Tompkins County Department of Health, Ithaca, N. Y., effective July 1.

Southern States

CAROLINE H. CALLISON, M.D.,† former Health Officer for Greenwood and McCormick Counties, South Carolina, has returned to the State Board of Health after receiving her Master of Public Health degree from Columbia University, New York, N. Y., and has been assigned to the Charleston County Health Department.

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* Fellow, A.P.H.A.
† Member, A.P.H.A

BERNARD D. DAITZ,* formerly Major, Sanitary Corps., Medical Rehabilitation Service, Veterans' Administration Hospital, Oteen, N. C., has been appointed Assistant Executive Officer, Medical Rehabilitation Service, Department of Medicine and Surgery, Central Office, Veterans' Administration, Washington, D. C.

HARRY EAGLE, M.D., has been appointed Scientific Director of the National Cancer Institute and will be in charge of research. He has been with the U. S. Public Health Service since 1936 assigned to research activities at the Johns Hopkins School of Hygiene and Public Health. He is noted for research on an improved method of treating syphilis, and for work on the cause and cure of sleeping sickness.

CLARA C. JOEL FLEISCHER, M.D., has been named Director of Maternal and Child Health of the City Department of Health of Richmond, Va., a newly created post. She will develop a city-wide program of maternal, infant and preschool health.

T. PAUL HANEY, JR., M.D.,* on July 1 took office as Director of Maternal and Child Health of the Florida State Health Department. For the past 7 years he has been Health Officer of Jones County, Mississippi.

J. W. MOUNTIN, M.D.,* has been appointed Associate Chief, Bureau of State Services, U. S. Public Health Service. He was formerly Chief of the States Relations Division of the Bureau.

DAVID E. PRICE, M.D., Dr.P.H.,† who is a staff member of the Public Health Service serving with the Research Grants Division of the National Institute of Health, has been transferred to a related activity of the National Cancer Institute, Bethesda, Md., and is now in charge of the Research and Educational Grants Program of the Cancer Institute.

R. G. Ross, M.D., was named Supervisor of the milk control program for the Oklahoma State Department of Health on June 16.

DANIEL H. ROWE, M.D., has been appointed Health Officer of the Administration Health Unit composed of DeSoto, Charlotte and Hardee Counties with headquarters at Arcadia, Fla.

R. L. SIMMONS, M.D., M.P.H.,† has resigned as Director of the Lauderdale County Health Department, Meridian, Miss., to accept a position as Head of the Department of Preventive Medicine and Public Health at the University of Louisiana School of Medicine, New Orleans, effective August 1.

ALFRED H. WIETERS,* formerly Senior Sanitary Engineer, U. S. P. H. S., Washington, has returned to his former position as Director of Public Health Engineering, Iowa State Department of Health, Des Moines, Iowa, effective July 1.

HAROLD M. WILLIAMS, M.D.,† formerly Director of the Department of Public Health and Welfare of Fort Worth, has accepted appointment as Assistant Secretary-Editor of the State Medical Association of Texas, Fort Worth.

Western States

MILDRED E. DOSTER, M.D.,† on September 1 began her new duties as local health officer of the Washington City-County, Iowa, Health Department, and director of one of the state health districts comprising 7 of the counties of Iowa. Dr. Doster was formerly Director of School Health Service in the Denver, Colo., public schools.

GORDON C. EDWARDS, M.D., has been named Director, Division of County Health Units, of the Oregon State Board of Health. He succeeds RICHARD H. WILCOX, M.D., who recently resigned to return to his former post

of Umatilla County Health Officer. The new County Health Units Director has been for the last year Director of the Venereal Disease Control Section, and will continue to supervise the activities of this Section until a new Venereal Disease Control Officer can be named.

ROY O. GILBERT, M.D.,† formerly Assistant Health Officer and Director, Bureau of Preventable Diseases, Los Angeles County Health Department, has been appointed Health Officer of the County, effective May 6.

EDWARD KUPKA, M.D.,† returns to the position of Chief, Tuberculosis Service, California State Health Department. He left in 1944 to become Medical Director of La Vina Sanatorium, serving as consultant to the department in the meantime.

WALTER B. QUISENBERRY,* former acting head of the Department of Public Health and Preventive Medicine at the College of Medical Evangelists in Loma Linda, Calif., was recently appointed Chief of the Bureau of Venereal Diseases for the Territorial Board of Health, Hawaii.

RUTH J. RAATTAMA, M.D., M.P.H.,* who for several years has been Director of the Division of Maternal and Child Health in the Idaho State Department of Health, Boise, has resigned effective July 1.

Death

STEPHEN A. KOWALCHIK, Principal Sanitary Engineer, New Jersey State Department of Health, died June 18. He joined the engineering staff of the Department in 1930.

CONFERENCES AND DATES

American Association for the Advancement of Science, Chicago, Ill. December 26–31.

American College of Hospital Administrators. St. Louis, Mo. September 21–22.

American Dietetic Association. Philadelphia, Pa. October 13–17.

American Hospital Association. Annual Convention. St. Louis, Mo. September 22–25.

American Public Health Association—75th Annual Meeting. Atlantic City, N. J., October 6–10.

American Public Works Association. Jacksonville, Fla. October 5–8.

American Water Works Association:

Four States Section. Washington, D. C. November 19–21.

Iowa Section. Cedar Rapids, Iowa. October 9–11.

Joint Meeting—Florida and Cuban Sections. St. Petersburg, Fla. November 20–22.

Kentucky–Tennessee Section. Louisville, Ky. September 22–24.

Michigan Section. Bay City, Mich. September 18–20.

New Jersey Section. Atlantic City, N. J. November 6–8.

North Carolina Section. Greensboro, N. C. November 10–12.

Ohio Section. Columbus, Ohio. September 30–October 1.

Rocky Mountain Section. Cosmopolitan Hotel, Denver, Colo. September 25–26.

Southeastern Section. Atlanta, Ga. November 3–5.

Southwest Section. Amarillo, Tex. October 13–15.

Virginia Section. Roanoke, Va. November 17–18.

West Virginia Section. Bluefield, W. Va. October 2–3.

Wisconsin Section. Hotel Schroeder, Milwaukee, Wis. October 23–25.

Civil Service Assembly. Dallas, Tex. November 17–20.

Florida Public Health Association. Tampa, Fla. October 23–25.

Georgia Water and Sewage Association. Georgia School of Technology. Atlanta, Ga. September 17–19.

International City Managers' Association. Coronado, Calif. October 5–9.

International College of Surgeons—12th Annual Assembly and Convocation of the United States Chapter. Palmer House, Chicago, Ill. September 28–October 4.

Michigan Public Health Association. Detroit, Mich. November 5–7.

National Association of Housing Officials. New York, N. Y. November 17–20.

National Committee for Mental Hygiene, Inc. Hotel Pennsylvania, New York, N. Y. November 12–13.

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